

NAG
v.10

TENTH ANNUAL REPORT

OF THE

NEW JERSEY

State Board of Agriculture,

1882-3.



RAHWAY, N. J. :
LEWIS S. HYER, PRINTER.

1883.

THE UNIVERSITY
OF ILLINOIS
LIBRARY

630.7
N46
v.10





Digitized by the Internet Archive
in 2014

<https://archive.org/details/annualreport1018newj>

TENTH ANNUAL REPORT

1927
18
1891

OF THE

NEW JERSEY

State Board of Agriculture,

1882-3.



RAHWAY, N. J. :
LEWIS S. HYER, PRINTER. ^c
1883.

630.7
1146
710

35
N. J. STATE BOARD OF AGRICULTURE.

— ♦ —
OFFICERS FOR 1883.
—

PRESIDENT.

HON. THOS. H. DUDLEY.....CAMDEN.....Camden County.

SECRETARY.

P. T. QUINN.....NEWARK.....Essex County.

EXECUTIVE COMMITTEE.

WM. S. TAYLOR.....BURLINGTON.....Burlington County.

THOS. T. KINNEY.....NEWARK.....Essex County.

EDWARD BURROUGH.....MERCHANTVILLE.....Camden County.

PROF. M. E. GATES.....NEW BRUNSWICK.....Middlesex County.

CHEMIST OF THE BOARD.

P. TOWNSEND AUSTIN.....NEW BRUNSWICK.....Middlesex County.

PRESIDENT'S ADDRESS.

President, Hon. Thomas H. Dudley, Camden, N. J.

The annual meeting of the State Board of Agriculture was held at the State House, in Trenton, on Tuesday and Wednesday, the 6th and 7th of February, 1883.

The meeting was called to order, at eleven o'clock, by the President, Hon. Thomas H. Dudley, and, after the usual preliminary business, he delivered the following address:

Gentlemen of the Board of Agriculture:

Another year has passed since we last met in these halls. Its cares, its duties and labors are over, and the impress, for good or evil, been made on the scroll of time, never to be effaced, but to remain forever. A new year, with its hopes and aspirations, has dawned, and is before us; we can all join in the desire that it may be equally prosperous to our country, and its burthens prove no heavier than the one that has gone. That its duties will be as many and as imperatively exacting, we must expect; but they should be met and borne cheerfully, for in this way our prosperity will be made more certain and our individual happiness more sure.

Each one will have his work to do, and whether progress is made and civilization advanced or retarded, depends on how well we perform this work and discharge these duties.

This institution, organized to benefit the husbandman, has its work also to do.

There are burthens to be removed, reforms to be suggested, improvements to be introduced, and experiments to be made for the benefit of agriculture, that are as important and necessary as any that can engage the attention and consideration of man.

In the discharge of my duty as President of this Board, I beg briefly to call your attention to some matters in that direction, which I think worthy of your consideration.

And, first, in regard to the subject of fencing. By the census recently taken, we have 34,307 farms in New Jersey. These farms are all, to some extent, fenced. Now fencing is one of the heaviest taxes the farmer has to pay. These farms contain over 2,000,000 acres of land, about two-fifths of the land in the State. If this should be laid out in ten-acre fields, they would make 200,000 fields, and if each field should cost \$110 to fence it, then the fencing alone, in New Jersey, costs the farmers \$22,000,000.

The interest on this would amount to \$1,320,000 a year. You must add to this the wear and tear and expense every year of keeping these fences in repair.

Now, if the wear and tear on your fences, and the cost in labor and material in keeping them in repair, should not exceed the sum of five per cent. per annum, it would make the sum of \$1,100,000, which, with the interest added, would amount to the enormous sum of \$2,420,000, all of which has to be paid by the farmers out of the profits from the farms, which at most are not large. These payments make a drain upon their limited resources that they cannot well bear, and from which they ought to be relieved if there is any possible way to do it. Suppose a law should be passed by the State, imposing a tax of \$2,420,000, not on the farmers alone but upon all the people, what would be said? Every man and every newspaper, from Bergen to Cape May, would be loud in protesting and denouncing it, and yet our farmers every year pay a tax equal to this for fencing their farms.

In many parts of Europe they have done away with fences. In most parts of France, Belgium and Germany there are no fences. I have been on commanding heights in some parts of France where the eye had a wide range on all sides, and thousands of acres came under the gaze, and, as far as sight could carry, there would not be a fence or anything to represent one. The land would all be under cultivation yet there would be no fences.

The farmers of New Jersey cannot afford to expend so much money for fencing their farms, and yet it is supposed that the fences in the State have cost more rather than less, than the sum above stated; the question therefore comes home to this Board, whether anything can be done to relieve them from this burthen.

But few things contribute more to the comfort of the traveler than good roads.

The good roads of England have long been a theme upon which

her writers have dwelt, and a subject that has claimed the attention of every traveler and tourist who has passed through the country. Englishmen are in the habit of referring with just pride to their good roads and substantial bridges, and certainly they have a right so to do, for no country in the world has better. And this applies to the whole Island.

It matters but little where you are, whether on the lowlands of Kent, among the mountains of Wales or Scotland, in the beautiful lake district of Cumberland and Westmoreland, or amid the fertile agricultural parts of the interior, you always find them. It is not only the traveler who passes over the highways for business or pleasure that is benefited by the good roads of a country. The owners of the land themselves are equally benefited. Good roads beautify the country through which they pass, and make it more attractive, and in this way enhance the value of the land.

A good road seems to change and better the very nature of the soil itself that lies along it; and persons in the purchase of a farm or place for a country seat, would prefer and be willing to pay more for a location on a good than a bad road. There is no State in the Union, if there is any section of country anywhere, that would be more benefited by good roads than the State of New Jersey. It has natural advantages over any other State or section. With large and growing manufacturing industries and thriving towns and cities, we shall soon have a dense population.

The State has the two largest cities in the Union bounding it, New York on the one side and Philadelphia on the other, only ninety miles distant from each other. The more attractive and inviting we make our State, the more it will be resorted to.

Our sea coast will be built up and become almost a continuous city from Sandy Hook to Cape May for those who seek pleasure, or a home by the sea; whilst the interior not occupied by the busy industries of the various manufactures, will be taken by those who desire retirement and repose in the country. The farms are now too valuable to raise corn and wheat, and must soon be turned into gardens for vegetables and fruits to feed our own cities and those lying on our borders.

Even our lands known as the Pines, which, in years gone by, were regarded as barren and comparatively worthless, except for growing timber, are well suited and adapted for this purpose, and possess a value now far beyond that computed by the present owners.

The land owners of the State can afford themselves to improve and put the roads in good condition. Nothing will pay them better. Aside from the comfort of traveling and the ease and advantage in marketing their farm or manufactured products, and carrying on their business, whether it is agricultural or mechanical, they will be more than doubly paid for all their expenditure by the increased value it will give to their lands.

Those nearest to the cities will be most benefited, but even those living remote will be more than repaid for all that is judiciously expended in this way. Put your roads in good condition and beautify the country and you make your State attractive for all those who want pure air and healthy country homes.

In South Jersey, and it may be in other parts of the State, a practice which is much to be deprecated is growing up, that of encroaching upon the highways by the land-owners setting their fences out into the road. The practice is bad in every particular, it destroys the symmetry of the road and renders it unsightly, and though kept in ever so good condition, detracts from the beauty of the country, and in this way takes from the value of the land. The land-owner who does it, and thus attempts to rob the public, loses more than he gains in the loss to his own property. Unfortunately his neighbor suffers as well as himself. The stone thrown into the lake sends its ripple to the shore. Any person desiring to buy a farm would take one on a good wide road where there are no encroachments, rather than one, no better in fertility and natural advantages, on a road where the beauty and symmetry are thus destroyed. The width and symmetry of our roads should be retained, and steps taken to stop encroachments, by the enactment of laws for their removal in a summary way, and the punishment of the offenders by severe penalties.

All that part of South Jersey known as the Pines, stretching from Monmouth county to Cape May, were formerly covered with timber. There were other large tracts of timber lands and forests, interspersed over the State. The timber has been cut from nearly all these lands. Not content with cutting down the forests, the work of demolition has been extended to the isolated trees standing in the clearings, on the farms, and along the highways, which tended so much to beautify and render attractive the landscape, whilst at the same time affording most grateful shade to the animals that roamed over the plains or fed

upon the rich pastures of the fields. To such an extent has this work of cutting timber been carried, that but few forests now remain. Aside from the great loss of timber and the danger of a wood famine at no very distant day, if steps are not taken to arrest this destruction, and proper legislation adopted to encourage the planting of trees, and the growth of forests, the effect it may have, if it is not now producing upon our atmosphere, in the diminution of the amount of rain that falls upon the earth, is a question that deeply concerns the farmer as well as others, and is worthy of the most careful consideration of all our people, and especially those entrusted with making our laws. There is no doubt but what the clearings in the swamps and forests, as well as the laying down of tiling to drain the land, have already very materially affected the springs and many of the streams and water-courses in the State.

The English landscape is said to be the most beautiful in the world, and certainly it has attractions which none can fail to observe, and all must admire. A part of this, no doubt, comes from the deep, rich color of the foliage, produced by the damp, humid atmosphere of the country, but much more from its cultivated hedges, and the beautiful trees which are planted in their fields and lawns. Here in the United States a tree is wantonly cut down; there it adds beauty to the scene, gives grateful shade to the tired and weary, and is spared and protected. Land in this country seems to be too scarce to permit a forest or allow even the growth of a tree, and so plentiful in England that trees are necessary to make land valuable. There, when a tree grows old and is battered and broken by the storms that beat against it, it is propped and braced, and retained so long as a branch remains; here, the sprig that shoots from the ground is ruthlessly torn up, and the axe of the woodman laid at the root of the tree long before even rot or decay has reached its trunk. It cumbereth the ground and is therefore hewn down.

In France, indeed in most parts of Europe, much attention has been paid to the cultivation of forest trees. Their rivers and streams and many of their roads and highways are planted on both sides. It gives a pretty and picturesque appearance to the country. But for the cultivated trees, France to-day would be entirely dependent upon other countries for its wood and timber. Much has to be imported, but what they obtain from their own cultivation is very considerable, and goes far towards supplying their wants. One of the most beau-

tiful forests I have ever seen is that on the road leading from Brussels to Waterloo. This, like most of the other forests of Europe, has been planted, and what strikes an American as peculiar is that the trees are in rows. Many forest trees have been planted in England and Scotland. The late Duke of Atholl, whose estates lie near Dunkeld, in Scotland, planted during his life over 30,000,000.

All the trees in the beautiful park at Windsor have been planted. Great care has been taken to preserve not only the trees but the date of planting the different tracts. These dates are set up along the roads, so one in riding through can see the growth from year to year.

The time has arrived when steps should be taken to preserve our forests, and encourage the planting of forest trees. This is as necessary to preserve our climate as it is to prevent at no very distant day a wood famine in the State.

In 1834, John Bennet Laws, of Rothamstead Herts, England, commenced his experiments in agriculture; in 1843 he opened his laboratory, and established his Agricultural Experiment Station, now so well known all over the world. This was started in the first instance in a barn, and was the first institution of the kind in Europe. Mr. Laws received a collegiate education, and soon after graduating came into possession of a large estate. Having time and means he resolved to devote both to experimental farming for the benefit of mankind. For more than forty years he has devoted his time, his superior culture and his means to this work. This has been done not only in the laboratory, but in a series of field experiments, in wheat, oats, barley, potatoes, beets, grass and other productions of the soil, as well as feeding experiments with animals. With Mr. Gilbert, and sometimes as many as ten assistant chemists in his laboratory, and a large and very valuable farm of several hundred acres of land devoted to field and feeding experiments, and over a hundred men in the summer season to cultivate the land and conduct the experiments, without regard to cost or expense, he is giving to mankind an amount of information which is beyond all value, and stamps John Bennet Laws as one of the benefactors of the age. The results of his labors have been given to the world in some eighty volumes or pamphlets, which remain not only for the benefit of man, but will go down to all generations as an imperishable monument of his devotion and efforts in behalf of agriculture. Whilst the work he has done is great and of inestimable value to the world, as well for those

who now live as those who are to come after us, it is not to stop with the termination of his life, but to go on after he has ceased to live; for by his will, which has been prepared, such portion of his farm as may be required, with about half a million of dollars in money, has been left in trust, the farm and the income of the money to be used in carrying on these experiments. When Laws commenced there were no Agricultural Experiment Stations in Europe. There are now over 120. Germany alone has seventy-five; Austria, sixteen; Italy, ten; Sweden, six; Russia, France and Switzerland, each three; and Belgium, Holland, Denmark and benighted Spain, each one. The United States, generally foremost in all improvements to benefit the people, has been slow in establishing these institutions so necessary for the development and successful prosecution of agriculture. Indeed, the general government and States have been very tardy in doing anything for this great industry.

Whilst the purse-strings of the treasury have ever been open and loose for all kinds of political schemes and jobs, and some of a very questionable character, they have been closed against agriculture. Rich and munificent in its contributions towards many other things, the government has left agriculture pretty much to take care of itself. And, as with the general government, so with the different State governments. They too have done but little, if anything, either to give information, knowledge or aid in conducting experiments necessary for its proper development. Connecticut and North Carolina were the first States to establish Agricultural Experiment Stations. Our own State then started. The legislature appropriated the sum of \$5,000, which has since been increased to \$8,000, per year, to conduct the Agricultural Experiment Station. The State can pay from \$100,000 to \$120,000 per year for advertising its laws, &c., and printing the reports and legislative proceedings, many of which are never read, but serve admirably for waste paper, while it can only afford to give \$8,000 for the Experiment Station for the benefit of agriculture. But as much of this money goes towards sustaining the political newspapers of the State, some of which, probably, could not live but for what they thus obtain, the people must not complain; for politics and the politician must be sustained, even if agriculture is neglected and left to decay.

New York, in 1881, appropriated \$20,000 per year to establish an Agricultural Experiment Station, and in 1882, an additional sum of

\$25,000 to purchase an experimental farm. These, no doubt, will prove of great value to the farmers of the State.

The Agricultural Experiment Station of New Jersey was established under the act of the legislature approved March 10th, 1880. It opened a chemical laboratory at New Brunswick, under the charge of Prof. George H. Cook, as Director, with Prof. Arthur T. Neale and two assistants in charge of the laboratory. Since the opening of the institution an amount of work has been done, considering the limited means at the disposal of the Managers, and the consequent small number of employes to conduct the experiments, not surpassed by any institution in this or any other country; and of a value to the farming interest of the country almost beyond computation or calculation. The experiments made and the work done remain. They are not only useful here in this State, and valuable for the present time, but many of them are equally useful for all countries, and good for all time to come. Mankind everywhere, directly or indirectly, will be benefited by them. The man who, by experiment or practice, teaches another how to produce a single more bushel of wheat or corn from his land, is a public benefactor. Farming is but in its infancy. There is much, very much, to learn. Experiments can only be properly and successfully carried on by government institutions. Individual farmers, as a rule, cannot afford to experiment, even if they had the time to devote to it. To be of value it must be done with care, skill, and great accuracy. To do this requires time and means. We have no John Bennet Laws in the State of New Jersey, and probably there is no one in the Union who would be willing to devote his time, much less a princely fortune, on this great industry; although by so doing he might confer a benefit on mankind, and, possibly, earn the proud title of being a public benefactor. Hence, the agriculturist of the United States must look to the general government and State governments to institute and carry on this work. Fortunately for us, there is no State in the Union but what is amply able to establish and endow such stations, and buy farms of sufficient capacity for field experiments, and as many as are needed, if they are disposed so to do. In our own State, crippled as the Experiment Station has been, with the insufficient and inadequate appropriation placed at the disposal of the Managers, and without any land, except that which belongs to the Agricultural College, they have been enabled to do much good, and think they

have benefited the farmers a hundred-fold for every dollar spent. There are twenty-one manufacturers of fertilizers in New Jersey, with a capital of over \$1,000,000, manufacturing products in value amounting to \$2,423,800. Of those manufactured here, it is not pretended that all are used in the State. Much is sold to farmers in other States, but, while admitting this, there are thousands of tons manufactured in other States that are brought here and used by our farmers. Now, of those manufactured here, if they should fall ten per cent. short of the standard of value, the loss to the farmers who use them would be over \$200,000 a year.

The first year of the existence of our station there were analyzed ninety-two samples; the second year, one hundred and sixty, and during the past year, one hundred and fifty-four, making in all for the three years, four hundred and six samples of fertilizers examined and analyzed. With these figures before you, and the fact of this institution standing as a guard and sentinel between the farmer who buys and uses, and the manufacturer who makes and sells, and the almost certainty of exposure if fraud should be attempted, it is not to be wondered that great care has been taken by the manufacturers of the State to have their productions fully up to the standard. *

It is believed that the good that has thus been done and the amount saved to the farmers in fertilizers alone, cannot be easily computed. But, as useful as the institution has been to the farmers in the matter of fertilizers, it is not in this field alone that it has been of benefit. It goes out and extends its usefulness far beyond this. It has analyzed and determined the quality and value of milk from different breeds of cattle. It has taken up the question of feeding cattle, and the different kinds and value of fodders. It has given you rations for the cow, told you the value of cotton-seed meal, of brewers' grain, and how to use the corn-stalk so as to make it equal to hay for feeding purposes. It has given you information about the construction of the silo and the benefit and utility of ensilage as a food for cattle. If the field experiments have been few, the cause is found in the limited and inadequate means to carry them on, and the want of land upon which to conduct them; yet while few, they are not unimportant. We have demonstrated that sorghum can be cultivated in this State as a valuable and profitable crop, and this in the face of the report of the United Commissioner of Agriculture to the contrary. It has also been proven that the seed from the sorghum is valuable for feeding cattle; that a

bushel of this seed is nearly, if not quite, equal to a bushel of Indian corn, and that the yield per acre of seed, independent of the sugar and molasses extracted from the stalk, is probably forty per cent. of what the same land would produce if planted with Indian corn.

But the Agricultural Experiment Station is not limited in its labors and experiments to the analysis of fertilizers, fodder and milk, or to questions of food for animals, or to field experiments on a small or large scale, important and valuable as these are. It will tell you the manure or fertilizer necessary to produce your crop, that which is best for wheat, and that most sure for corn; in a word, should and will, when sufficient means are given to carry on its work, tell you how to feed your land as well as your horse or cow. Whilst chemistry can tell you the constituent parts of the stalk, as well as the grain of wheat, experiments can and will tell you how much and what part of each has been taken from the atmosphere, and how much and what part of each from the earth; for the plant draws on the winds and showers, as well as the earth, for matter and substance to form it. The substantial and hardy stem, the delicate leaf that sways in the breeze, the beautiful flower that fills the air with its fragrance, the golden fruit so delicious to the taste, and the rich grain of the harvest so necessary to sustain life in man as well as beast, are not all of the earth; the earth, to be sure, supplies its part, and the gentle rain gives its share, but the atmosphere also constitutes a part equal in importance, and as necessary to complete and perfect, either the fruit or the flower, as the earth or the shower. Now, in order to know how to feed his land properly, the farmer must know the kind of food it requires; to learn this, he must know what the plant has taken from the atmosphere, and the shower, as well as the earth. When he learns this the work is easy and simple, to give back to it that which it has contributed to the grass and grain that fill his barns and storehouses.

The diseases of the plants, vegetables and fruits, as well as the exhaustion of the soil, are also within the scope and range of the duties of the Agricultural Experiment Station. It has already taken up some of these subjects and, it is thought, given valuable information about them. But here, as in the field and other experiments, means are wanting to make the institution what it should be, and what it *would be*, in its usefulness and benefits, if adequate means were supplied to properly conduct it.

Mr. Laws recently, in talking to a friend, made this remark,

"The great question of the day is how to restore to the land that which has been taken from it." There is another question of equal importance to this. I should put it in this way: the two great questions of the day are, first, how to make land more productive, and, second, how to restore or give back to it that which has been taken from it by production. It is a well known fact that land used for grazing purposes for a number of years, however fertile, becomes worthless for grazing unless you restore to it that which the cattle have taken from it; so with land upon which you plant continuous crops, either of wheat, corn or any other grain, year after year. But the question is much broader and goes very much farther. Land continuously cultivated with crops in rotation, if not properly fed, will become entirely exhausted, to such an extent that no crops can be profitably raised upon it. It becomes comparatively worthless either for tillage or pasture. The substance of the land upon which vegetation feeds is gone, and though the gentle showers may fall and the atmosphere give its part generously, yet the plant will not grow, and it is in vain that the farmer sows, for the harvest will not yield. He will have spent his strength in vain, and made his efforts to no purpose, for there will be no return. The desire is too prevalent with many, to get as much as they can from the land, and to return as little as possible to it. They treat it as they do most things about them—take much and give but little back. It is the game of every-day life, but cannot be played with as much impunity with land as when played with man. He may take from his neighbor and possibly escape without punishment, but he who robs his lands steals from himself and pays the penalty in the loss to his crops.

Of the thousands and millions of tons of animal and vegetable matter, in the way of meats, breadstuffs, fruits and vegetables that go to your cities to feed the people, say of New York, Brooklyn, Philadelphia, Newark and other towns, how much is ever returned to the farms from whence it is taken? Of the hay and straw, probably most is returned in the way of stable manure, but of the other matter comparatively nothing. Though not lost, for in nature we are taught that nothing is entirely lost, it is transformed and carried by the sewers and drains to the rivers and thence to the ocean's bed, where it most likely will remain, practically forever lost to the land that has produced it, until nature in its convulsions and upheavings in the new formations to occur in the far-distant time to come, now even beyond

the comprehension of man, may possibly give it back again to the land. The subject of utilizing the deposits in the cesspools and the drainages from the sewers, is one well worthy the consideration of all those who take an interest in agriculture or regard the welfare of mankind in the future as important. An attempt has been made to utilize the drainage from the sewers of London. Any one in passing down the river Thames, just below Greenwich, will observe large works built for this purpose on the banks of that river. This attempt has not proved a great success or been generally followed, and, with few exceptions, all the manures and drainages of the cities of the world are permitted to pass away without so much as an effort to return them to the land. Nothing is more rich as a fertilizer, and nothing would do the land more good. Indeed, there are those who doubt if any artificial fertilizer is equal to it, or can entirely supply its place.

It is true that the disintegration of the rocks, which is constantly going on in the earth, tends in a small degree, in certain localities, to renew the land; and that the manufacture of artificial fertilizers does much to compensate for that which is taken from it. Yet when one will take his stand at the entrance of one of our large cities and see the immense mass of matter in the way of food, that enters it, and then note the small quantity that is returned again to the land from whence it came, he cannot but be impressed with the great loss that is constantly taking place.

History tells us that Carthage at one time could send out an army of two hundred thousand men from its gates. At this period no doubt all the northern portion of Africa was filled by a dense population, with many cities, towns and villages, all of whom obtained their food from the land. To feed so many people, and to sustain such a population, the land must have been most fertile and productive. How is it now? What is the condition of the land, and where are the people who once inhabited this country? The cities have disappeared and the towns and villages are not; and the places that have known them shall know them no more. Even Carthage, with all her greatness, power, and grandeur, has disappeared; and scarce a vestige of it is to be found. Indeed, so complete is the work of its destruction, that there is doubt even as to where it was built. Not only are the cities, towns and villages gone, but the population of the country is also gone, and the land which once fed them is now so sterile and barren, that it will scarcely feed the people of the few modern towns that have been built, and the predatory tribes of Arabs that roam over it.

Palestine was a land described to be immensely fertile; so much so that the Bible declares it to be overflowing with milk and honey. Certain it is that from the accounts we have, both before and after the Israelites took possession, that it was inhabited by a large population. It had cities, towns, and villages. All these people, all this dense population that moved over and lived upon, were fed from the land. How is it now with Palestine? Not only the population has gone; but much of the land, which was once most fertile and productive, is now sterile and barren. There is still land there which, if properly cultivated, would produce crops, but not enough to support and feed the population that once lived there. What has produced this change? What has made these lands in Palestine and Africa, once so fertile and productive, now barren and unproductive?

If the same system prevailed there then that prevails here now, of taking more from the soil than is returned to it, may it not account for the condition in which we now find the land in these countries? When you know just how much more you take from than you return to the land, it is reduced to a mathematical question, as to how long time it will take to exhaust it and render it barren. Even if the desert has encroached upon some lands once fertile, the encroachment was made more easy, and the land more fitting for the desert, by the previous exhaustion of the soil. Barren land invites the desert; indeed, there is but a step from the one to the other.

In all things relating to the planting and gathering of crops, great improvements have been made, and in no country has there been so much progress as in the United States. The inventive genius of our people has been most actively displayed, until we stand to-day far ahead of any other people or nation in all kinds of machinery and appliances relating to the useful arts, and more especially to agriculture. We have the mower, the reaper, the binder, and the threshers, drills for planting, the patent plows, rakes, cultivators, and harrows. Indeed, for almost every kind of agricultural labor there is some kind of labor-saving machine; while this is so, and so much has been done to lessen and make more easy the labor of the farmer, comparatively nothing has been done, and nothing learned, in the way of increasing his crops either in kind, quantity, or value. In this the world has not moved. But little, if any, progress has been made during the last hundred years. Our ancestors planted corn, wheat and potatoes, and we plant corn, wheat and potatoes. They rotated the crops, and we rotate

them. One year with corn, one with potatoes and one with wheat followed with grass, and so year after year in the circle of time for the century; and as with one so with all without change, as if it were to continue to the end of time. There is no industry but what there has been improvement and change in the mode of production, and an increase in the amount of product produced, except agriculture. With corn, wheat and potatoes there has been but little if any increase or change. The man who ploughed well and manured well a hundred years ago, obtained as good return as he who plants now.

One farmer plows deep, and another shallow; one spreads his manure on the top and calls it top-dressing, while another plows it under; and probably no two farmers agree upon the subject, or can give any satisfactory reason why the one is to be preferred to the other. Indeed, that which may be best one year may not prove best the next; the difference in soil, the temperature of the season, with the amount of rain that falls, may produce different results, and baffle the well-formed calculations even of those who have given it most thought. That so little progress has been made in the way of production in agriculture is not to be wondered at, when you consider how little has been done by the governments of the world, including our own, and all the State governments as well, for this industry, and how impossible it is for individuals in their individual capacity to do it for themselves.

The farmer is dependent upon his yearly crops for the food his family eats, and the clothing they wear. He cannot afford to lose a crop. He must therefore plant that which he knows to be most certain to yield. He cannot afford to experiment when the experiment may lose him his crop for the year. He must, therefore, of necessity, continue to sow and plant as his forefathers have done, in the same manner and with much the same result, until a more liberal policy on the part of the government will provide means sufficient to establish and enable Agricultural Experiment Stations to carry on experiments absolutely necessary for the improvement and progress of agriculture, and which, when done, will be of such inestimable service to the farmer.

There is no field of human industry more inviting to scientific experiments, and none in which there is greater promise of most useful and beneficial results.

In the Island of Jersey there are but few farms that contain more

than twenty acres of land, and yet on these small farms the farmers manage so to cultivate them that they live and support their families (sometimes large ones) off of these farms; and I can say from actual observation, that they seem to live as well, and to have as many of the comforts and luxuries of life about them, as the farmers of our own highly favored State. The late Captain Labby, at that time Secretary of the Royal Agricultural Society of the Island, told me on the occasion of one of my visits to the Island, that most of their land was worth one hundred pounds per acre, in our money near five hundred dollars; and yet that their farmers could afford to pay this price for it for agricultural purposes; and that he had known many instances where the farmer had paid the whole of the purchase-money with the profits of the crops in one season.

I refer to this to show what it is possible to do in farming by planting profitable crops, and the use of proper manure and fertilizers. To obtain such results, the farmer must not only understand his land, but how to cultivate it. We have as capable, intelligent and industrious farmers as there are in any country. With a soil capable of producing and a climate highly favorable to production, and with natural advantages of location not surpassed by any section on the globe, all that is required is proper scientific information, to be learned only by experiments properly conducted, to make the lands of New Jersey as valuable and productive as any in the world.

REPORT OF EXECUTIVE COMMITTEE.

Soon after the adjournment of our most successful meeting last year, the Executive Committee met and organized by appointing William S. Taylor chairman. The Secretary of the Board, P. T. Quinn, being by our By-Laws *ex officio* secretary of the committee.

We have from time to time, as necessity required, held meetings, and endeavored, as far as practicable, to carry out our new law re-organizing this body. In most of this work, we regret to report, we were deprived of the most efficient services of Hon. George W. Atherton, he having accepted the presidency of the Agricultural College of Pennsylvania, and while we congratulate them upon obtaining such an acquisition, we feel that our Board has lost one of its most active and useful members.

Under our new law, the various societies, clubs and granges in each county are required to organize, and each county board is entitled to one delegate, who, after the apportionment this year, will be elected to serve two years.

Such boards have been established in Atlantic, Burlington, Camden, Essex and Gloucester counties, and we recommend that their representatives be apportioned by the Executive Committee, and each board notified.

No provision having been made to defray the expenses to attend in person the various county meetings, we have had to depend largely upon correspondence, and while no difficulty has been experienced in the organization of the several bodies, still, the greatest work is yet to be accomplished, which is to make them useful and practical to the agriculturists, and, in turn, helpful in carrying out the purposes of our Central Board. Unless means are adopted through which the hearty coöperation of our best farmers are secured, and so the meeting of the county boards made interesting and instructive, the objects of our new law, which designed these bodies to be the channels through which a more intimate relationship with the farmers should be established, will fail to be accomplished.

It is impossible for a central board to gather statistics sufficiently accurate to be of use to the agriculturist, but each county, by properly distributed committees, composed of men interested in the agricultural development of our State, could make returns that would be reliable and of great value to our farmers. Situated as we are, between two great and populous cities, our lands increasing in value each year, it becomes our duty, as tillers of the soil, to keep ourselves and each other posted on the various changes and requirements of our business. All other trades find the necessity of concerted action, and why should not the farmers, the men on whom all depend for their daily sustenance, act together?

This is the grand object of this Board; it is intended to be purely a farmers' institution, and if it fails of its object it will be through the lack of zeal on the part of the farmers themselves.

Part of our work, the analyzing of fertilizers and experiments in applying them, and the feeding of cattle, etc., are being carefully and satisfactorily handled by our sister institution, the Experimental Station. Much useful information has already been gathered and distributed, and we believe its good work has just been begun, and that its true value to our farmers will each year become more manifest. Standing, as we do, the third in the Union as an agricultural State, in proportion to our population, it is our duty as agriculturists, if we desire to retain our standing, to encourage the maintenance of such valuable institutions by our State, and to endeavor through our coöperation to increase their sphere of usefulness.

Through this body and its assistants, the county boards, we should be able to show in what direction and by what methods the most profitable returns for labor have been secured, the various crops grown, their yield and their values, suggestions as to reclaiming our waste lands, and many other subjects which would be beneficial, not only to farmers, but to every citizen of our State, and we repeat our conviction as expressed last year, to accomplish these results with efficiency and to the satisfaction either of the Board or the farmers of the State, it is desirable that the Legislature should be requested to make a more adequate appropriation of funds.

At certain seasons of the year the worth of the farmer to his country is extolled, he is praised as "the bone and sinew" in time of trouble, and when tax-paying day comes, his full share is exacted; but we question whether in the distribution of this money for the benefit of

the many interests of our State, his fair share is returned to that which is of most value to him and his vocation. The importance of a room for headquarters at the State House, accessible to the farmers and others, and which should be a center of correspondence and information and a suitable place for keeping the archives and collections of the Board, we called your attention to last year, and we again desire to express our convictions, that, while this may not be the proper time to urge the matter, it is a subject of vital importance to this Board, and should be kept before our members and the members of our Legislature. It is not an experiment, but many States have made such provisions, and it is but a just recognition of the requirements of the agricultural community of this Commonwealth.

We are pleased to be able to present to you a programme which, we think, cannot fail to interest all; as suggested last year, we have endeavored to cover a different line of thought, and would recommend our successors, from year to year, to follow the same idea.

Milton P. Pierce, Assistant U. S. Fish Commissioner, has kindly favored us with his presence and will interest many with a subject that has not received in the past the attention it is likely to in the future.

We were also fortunate in obtaining the consent of ex-Governor Pollock, of Pennsylvania, to address you this evening; other gentlemen have expressed their intention to be present and will read papers they have especially prepared, and a number of valuable papers have been offered that will also be read (where the parties cannot attend), and we trust the information derived from these and discussions upon them (which we hope all will feel at liberty to participate in), will amply repay for the time and expense of attending these annual gatherings, and that the interest may from year to year increase, so that through these meetings the cause of agriculture in New Jersey may be strengthened, and the value of this institution fully established and our law-makers fully convinced that the little asked for by the farmers has not been squandered, but has accomplished the work it was designed it should.

Respectfully submitted,

WM. S. TAYLOR,

Chairman.

MINUTES AS TO DISEASES OF ANIMALS.

BY E. M. HUNT, SECRETARY OF THE STATE BOARD OF HEALTH.

RECORD FOR 1882.

At the time when our last report was issued and our minutes completed as to the contagious diseases of animals, only one herd was held in strict quarantine because of contagious pleuro-pneumonia. Some cases of a chronic character were under surveillance, but all others had been disposed of by slaughter. The outbreak of undoubted anthrax, or splenic fever, which had occurred in Salem county was regarded as for the time quelled, although from what we knew of the tendency of it to be endemic, careful precautions were enforced as to it. Up to May 1st, no new cases occurred requiring quarantine, but precautions were taken as to the increase of the disease, which is apt to occur during the summer.

Attention was also given to applications to aid in facilitating the methods of transfer of imported cattle to owners in this State, and to such provisions of quarantine as the United States law requires.

Complaints continued to reach us, that owing to arrangements in force before this Board was placed in charge, great difficulty was experienced in the transfer of milch and store cattle to New York City.

Soon after the appointment of the present Commissioner for New York, correspondence was had and an interview which seemed to promise a basis of more equitable arrangement.

In May, information was received from the Board of Health of Mannington township, Salem county, that another case of sudden death had occurred in the herd in which anthrax had prevailed last fall. Information reached us too late to enable us to compare this case with the former ones by *post mortem* and proper examination. Some specimens, however, were sent to Philadelphia and verified the former diagnosis of the disease. The following is the statement made by

Prof. Joseph Leidy to the Academy of Natural Sciences, Philadelphia, May 23d, an examination of blood from the congested spleen having been made May 12th, or about forty-eight hours after the death of the animal. "It teemed with bacteria, of the peculiar form, *bacillus anthracis*, which is now viewed by most competent authorities as the cause of the frightful affection known as anthrax, or splenic fever. The bacilli were actually more numerous than the blood corpuscles, which appeared unchanged. - The bacilli were completely motionless; straight, bent or zigzag filaments, in the latter condition in pairs or more segments. They measured from 0.006 to 0.042 mm. in length; usually from 0.012 to 0.03 mm. Kept for some days in the blood the filaments underwent division into little chains in two, three, or more dumb-bells, which measure about 0.005 mm., or into isolated micrococci-like particles about 0.0015 mm. Many however of the filaments did not resolve themselves into these minute particles, but appeared only to grow in length and divide into segments of about 0.012 mm. in length."

The Secretary visited the farm as soon as notice was received and gave needed cautions. No specific treatment is recognized by veterinary authorities.

On account of suspicions as to pleuro-pneumonia in Essex county, Dr. Hawk, of Newark, was added to our corps of Inspectors, and a case of pleuro-pneumonia was soon found by him near Irvington. A second herd in the same vicinity was found also to be affected. These diseased animals were at once slaughtered, and all that had been exposed quarantined.

The person who had sold the infected cow was seen and effort made to trace the disease to its original source. It has several times come to our knowledge that there are in and about Newark and Jersey City dealers in the meat of diseased animals, who are familiar with this disease and who are pleased at its spread, because they are thus enabled to buy cattle at low prices and realize large profits. While we have facts as to their transactions, we have not yet been able to make a case in law, but have some such persons under proper surveillance.

Early in June we had occasion to examine a cow in Middlesex county, which had evidence of chronic lesions from this disease. As the cow was in good condition her sale for slaughter was permitted, although many such chronic cases may not convey the contagion.

Early in August there were reported outbreaks of pleuro-pneumonia near Manalapan, but the investigation showed a form of non-contagious disease. During this month the Secretary was asked by the Agricultural Department, at Washington, to investigate some alleged cases of anthrax or splenic fever as occurring near Reading, and thought to be similar to those at Salem, New Jersey. A visit and inquiry gave reason for the belief that the form of disease was similar. Just at this time, in Western Virginia and near Auburn, New York, similar cases occurred. Such cases are variously called splenic fever, anthrax, splenic apoplexy, Texas fever, etc. We have great occasion to fear lest at some time this disease or some of its forms may prevail. Unlike pleuro-pneumonia, it seems to have a local origin as well as to be brought to us. All cases should be speedily isolated and the Board apprized of them.

In July, the cases near Irvington threatened extension, and more stringent measures were taken to prevent the spread of pleuro-pneumonia.

As the Government Commissioner had noticed some cases of the disease as existing in the vicinity of Orange, our veterinary inspector was directed to visit and closely examine all stables which had been reported as having infected animals. The facts were traced and measures taken to secure from future trouble.

Our Board has long been cognizant of the fact that irresponsible butchers were in the habit of buying diseased cattle, and even of being pleased with the spread of contagious diseases as giving them the chance to buy herds at nominal prices. Hudson and Essex counties still need careful watch by local boards as to such persons. Our own detectives will still follow up suspected parties, and seek by summary means to protect from this vicious infringement upon public health.

During the month conference was had with A. Dennison, Esq., the newly-appointed Cattle Commissioner for New York State, and more satisfactory arrangements secured as to the transfer of cattle for the New York markets. While permits will still be necessary, they will be more readily attainable, and where examinations are needed, facilities are provided.

Early in September we had notice of a supposed outbreak of pleuro-pneumonia in Monmouth county, but investigation showed a non-contagious disease. Some sudden cases of death among cattle in Salem county also required the attention of the Board.

In October the only cases requiring attention were those occurring in Secaucus, Hudson county, one dairyman losing twenty cows. The evidence seemed to show it not to be a contagious disease.

In November, a disease, regarded as pleuro-pneumonia, occurred on a farm in Camden county. One cow died, one was killed, and the rest quarantined. The cases that occurred after the first were so mild as to cast some doubt on the certainty of the diagnosis.

Some cases were also reported in the neighborhood of Boonton, Morris county. Veterinary examination confirmed the opinion that the disease was pleuro-pneumonia. The sick animal was slaughtered, and the rest quarantined.

Accompanying this report will be found an additional circular in reference to animal diseases; also, the special reports of veterinary inspectors of the boards. The propriety of inoculation where pleuro-pneumonia tends to spread will be found discussed by the Secretary in the sixth report of the Board of Health. The Board acknowledges the ready coöperation of local boards. In the case of an outbreak of Texas fever in Burlington county, the local board, at our suggestion, prevented all cattle from running the highway, and in every way coöperated with us.

Within the last month a person who had sold an animal from a diseased herd, near Newark, has been convicted and sentenced therefor.

The annual reports now made to the State Board as to public health uniformly notice any diseases of animals which have occurred. Influenza, or pink-eye, among horses; isolated cases of glanders, a few local enzoötics of swine disease, and pneumo-enteritis, and fowl cholera, have caused some losses. All these diseases are undergoing investigation. Even where the cause is unknown, we are able to know the circumstances under which they develop, and the modes of limiting the spread of the contagion. It is now plainly manifest that by an organized and not expensive system we are able to aid in preventing or "stamping out" communicable diseases, and thus increase the industrial resources of the State.

CIRCULAR F.

[NOTE.—This and all former circulars can be had by addressing postal to New Jersey State Board of Health, Trenton, N. J.]

CIRCULAR F. OF THE NEW JERSEY STATE BOARD OF HEALTH, AS
TO THE CONTAGIOUS DISEASES OF ANIMALS.

TRENTON, January 4, 1883.

CIRCULAR F.

AS TO CONTAGIOUS DISEASES OF ANIMALS.

In addition to diseases already noted in the five former circulars of this Board, a few others have attracted our special attention because of their occurrence to a greater degree than usual in this State.

Diseases of Horses.

An epizootic, or general influenza among horses, has prevailed at various times in different countries. It has never prevailed so extensively in this country as it did in 1872-3, when, like a traveling epidemic, it commenced in Canada and proceeded with quite equal pace toward the south until it extended over the entire United States and Mexico. While its origin is unknown, its communicability seemed to be established from the fact that horses escaped on those islands to which others were not brought from the mainland, and that animals kept away from others and not brought out of their stables, sometimes escaped. The best account of the epizootic and its methods of treatment, is to be found in the history of it by Dr. A. B. Judson, Prof. Andrew Smith and Prof. A. F. Liataud, as contained in Vol. I. of the "Reports and Papers of the American Public Health Association," pages 88-109, and in the paper of Prof. James Law, as contained in the Report of the Department of Agriculture (U. S.) for 1872.

There was a slight recurrence of the disease in some parts of the United States in 1881-2, and in localities in this State it was quite common, although generally in a much milder form. It is a disease which has great variations in severity and in its class of symptoms and lesions. From the fact that the mucous membrane of the eye, in sympathy with that of the pulmonary organs, is often pink with a tinge of brown or yellow, it is frequently known as "pink-eye." This was its more common name as it prevailed with us the last season. About the same time it prevailed extensively in Glasgow and other parts of Scotland. The following outline and treatment of the disease as given by W. M. Anderson, Jr., before the Scottish Metropolitan Veterinary Medical Association, will serve as a valuable guide :

"The disease presents itself in several forms, which may be classified under four heads, viz.: Catarrhal, Edematous, Rheumatic, and Irregular. In all four forms the primary symptoms are alike, namely, dullness and languidness, then loss of appetite. At this stage we can, as a rule, determine what form the disease will assume. If Catarrhal, the animal has a slight cough, tumefaction of the submaxillary glands, with watery discharge from the nostrils, and the usual febrile symptoms, namely, increased temperature and rapid pulse; the conjunctiva has a yellowish appearance, and all the mucous membranes visible are injected. The pulse is seldom over eighty, more frequently ranging from fifty-five to sixty-five, the temperature varying from 101°-105° Fahr.

"I consider the disease takes four days, as a rule, to mature, at which stage the foregoing symptoms are increased. The previously injected mucous membranes become yellow; the animal gets very weak, in fact, staggers greatly; rapid emaciation sets in, still there is no inclination to feed, and it seldom lies. This state of matters generally continues for two or three days before convalescence sets in. The first convalescent symptoms are the eye brightening up and the animal showing an inclination to feed. It is astonishing how soon the patient recovers after convalescence sets in; the symptoms disappear as rapidly as they appeared, and in a few days the animal is apparently in good health. The fatal terminations of this form of the disease are generally due to pleurisy or gangrene of the lungs. When the disease assumes the Edematous form, after the primary symptoms the eyelids swell, then the legs—more especially the hind ones—tumefy considerably, and the sheath, as a rule, is greatly swollen. There are the usual febrile symptoms, with quick, weak pulse, and urine high colored, and often, but scantily, passed.

"The mucous membrane is infiltrated with a yellow fluid; there is great thirst, but no inclination to feed; rapid emaciation sets in, and in a number of cases diarrhoea is present. This form of the disease also takes about four days to mature. The eyelids are then completely closed, the pulse generally ranging from eighty to one hundred, the temperature from 102° to 105°. As a rule, several days elapse before convalescence sets in, and recovery is much slower than in the preceding form. Should death take place, it is generally through sheer prostration.

"In the Rheumatic form, which I must say is the most peculiar, we have loss of appetite and the mucous membrane injected; there is great lameness in one or more

limbs, oftenest in the off fore, without any apparent cause. The animal has an anxious look, as if suffering acute pain. The febrile symptoms are present, accompanied by an intermittent pulse; the lameness sometimes changes from one limb to the other; the back is in some cases 'roached,' and when the animal is moved it generally inclines to one side or the other. There is a difficulty in micturition, and the urine is highly colored. This form takes about ten days to run its course; and often the lameness continues for several days after the other symptoms have disappeared.

"The fourth form, which I have called 'Irregular,' includes all the complicated forms of the disease. The usual symptoms of fever and jaundice are present, but in some cases we have diuresis accompanying them, in others partial paralysis, again in others colicky pains, all of which require different treatment, according to their respective symptoms. I cannot say much regarding the *post mortem* appearances of this disease, as I had only one opportunity of witnessing an examination of a horse which was said to have died from the disease, and from all appearances emaciation was the cause of death. However, the mucous membrane all along the intestinal track was infiltrated with a yellow fluid, and the liver was enlarged. My treatment for this disease of course varied according to the symptoms present; but in every case in which fever existed the first thing I did was to rub the whole surface of the body with *acetic acid and water*. If the animal had a fine skin I mixed one part of the acid with two of water, but with draught or coarse-skinned animals I used equal parts. After rubbing the body and legs with this mixture, I ordered the animal to be well wrapped up in several blankets, from the head backwards, and the limbs to be bandaged; I also put half an ounce of nitrate of potash and fifteen minims of Fleming's tincture of aconite in half a pailful of cold water, and allowed the animal to drink it as he pleased. After the blankets had been on an hour I had them removed, and usually found the animal perspiring profusely. Having had him rubbed dry, and applied soap liniment to his throat and region of the liver, dry blankets and bandages were put on, and he was removed to a comfortable box or stall. The only food I allowed him was a few *sliced carrots*, mixed with some wet bran, and a handful of oats three or four times a day. In the Catarrhal form I generally applied the liniment to the throat twice a day, and in a few cases had to blister the throat with cantharides. I kept water with aconite and potash constantly before him, allowing him three to five doses in the twenty-four hours. However, after the first administration I limited the dose to two drms. nit. potass., and ten mims. aconite. If the fever continued, without showing signs of abatement, twenty-four hours after my first visit, I again applied the acetic acid and water.

"When I feared the disease extending to the chest I applied a counter-irritant, and gave sulph. ether two ounces, and camphor two drms., twice daily. In the Edematous form, besides applying the acetic acid and water to the body, and the liniment to the throat and region of the liver, I ordered his legs to be rubbed with mustard and water, the strength being one-quarter pound of mustard to a gallon of water, and then bandaged. I also gave mineral tonics in the form of balls.

"In the Rheumatic form I gave two drms. salicylic acid twice daily, and applied acetic acid to the affected limb or limbs. In the Irregular form my treatment, of course, varied. When diuresis was present I substituted carbonate of soda for nitrate of potash, and gave plenty of mashed linseed, also occasionally giving two drms. iodide of potassium. When partial paralysis presented itself, I gave sulph. quinine

and nux vomica. My opinion regarding the treatment of this disease is, that good nursing and comfort have more to do with the recovery of the patient than all the medicine we may prescribe."

PREVENTION OF CONTAGIOUS DISEASES.

Two points in respect of the contagious diseases of animals still need to be urged upon farmers and dealers. Because they are animals the laws of their well-being are definite and precise. If they are badly reared, ill-fed, badly kept, and if allowed to live amid their own filth, when it is in a state of decomposition or putridity, or to drink of water that is polluted, it is to be expected either that they will not thrive or that pestilences will occur. With swine especially, it is now quite well known that most of their diseases are primarily the result of enforced filthiness, and some of the diseases of other animals have a similar origin. Next, it is to be remembered that most of these communicable diseases among animals are transportable, and so arise by contact with diseased animals or with their secretions. As droves of cattle in course of conveyance, or while kept in city stock yards, are greatly *exposed, it is never wise to place unknown and newly-purchased animals with the general herd or flock, or in adjacent stalls until at least thirty days have elapsed. Even longer where any contagious disease prevails.*

INOCULATION FOR PLEURO-PNEUMONIA.

Within the last year an important paper has appeared on Inoculation as a Preventive of Pleuro-Pneumonia by R. Rutherford, M. R. C. V. S., of Edinburgh, which seems greatly to encourage the hope that some former risks are removed, and that when properly performed, we possess in it a means of limiting the prevalence of this destructive disease. His paper is contained in the June and July numbers (1882) of Fleming's *Veterinary Journal*. He states his conclusions in the following summary: 1-10, *see page 30, Veterinary Journal, July, 1882.*

"1. Inoculation is based upon the theory of pleuro-pneumonia being an eruptive fever.

"2. Inoculation is the application to a healthy animal of the virus of pleuro-pneumonia.

"3. Inoculation does not produce pleuro-pneumonia.

"4. An inoculated animal does not infect another animal.

"5. An inoculated animal cannot contract pleuro-pneumonia.

"6. The time occupied by the operation is from four to eight weeks.

"7. Inoculation in the case of milch cows does not materially interfere with their milking.

"8. Inoculated animals thrive better after the operation, and are stronger and freer from other ailments than those not inoculated.

"9. The loss arising from the operation need not exceed two per cent.

"10. From the fact that an inoculated animal is exempt from the disease, and that the average time required to develop and mature an inoculation is from fourteen to twenty-one days—that period may be accepted as the time required to arrest an outbreak."

He insists upon exact methods of procuring, preserving and inserting the lymph. His success fully justifies the provisions of our present law, while it shows the inadequacy and danger of the operation in unskillful hands.

In the *Veterinary Journal* for April, 1882, its editor, George Fleming, F. R. C. V. S., says:

"By a long continued series of experiments on animals, Dr. Willems, of Hasselt, Belgium, has succeeded in perfecting a method of protective inoculation, which is certain in its results. Further experiments with the cultivated germs of the virus are now being carried on with a view of obviating troublesome accidents which sometimes accompany the inoculation, and with every prospect of success."

The same distinguished authority in reply to an inquiry addressed to him by this Board, says:

"November 11th, 1882.

"Inoculation, as a protective measure for bovine contagious pleuro-pneumonia, has been, and is now, most extensively practiced on the continent of Europe and in this country, and there is no evidence that inoculated animals while suffering from the immediate effects of the operation can communicate the disease. There is only one such instance recorded (it is given in the *Veterinary Sanitary Science and Police*), but the circumstances attending it throw great doubts upon its correctness. I, myself, discredit it. I have absolute faith in the effects of the operation as a prophylactic measure, and would most certainly counsel its adoption where the disease prevails, *subject, of course, to suitable precautions as to the time and manner of performing the operation. This should be as carefully attended to as vaccination is with children.*"

ANTHRAX, OR SPLENIC FEVER.

Since the cases of *malignant anthrax*, or splenic fever, in Salem county, a few similar cases are thought to have occurred in Hudson county. The seriousness of the disease is shown by its ravages in some European countries, and especially in Russia. Prof. Tyndall informs us that in the single district of Novgorod, in Russia, between the years 1867 and 1870, over 56,000 cases of death by splenic fever among horses, cows and sheep were recorded. Nor did its ravages confine themselves to the animal world, for, during the time and in the district referred to, 528 human beings perished in the agonies of the same disease. The causes and cure of the malady are well summed up by Prof. Law in an article in the Second Report and Papers of the A. P. Health Association, page 476: "The most universally acknowledged cause of the malady in animals are plethora, or a state of blood highly charged with organic elements, an impervious soil or subsoil for pasturage, a very rich surface soil, inundations, a period of heat and dryness, calculated to foster decomposition of organic matters to a great depth in the ground, and a great contrast between the night and day temperatures. * * While this affection is communicable to animals by inoculation, it can scarcely be said to spread in any other way, and is, therefore, to be looked upon as essentially an enzoötic disease. We must go to such places as the inundated margins and deltas of large rivers, dried-up lakes and marshes, or the rich and pestilential Russian steppes, to find any approximation to the disastrous outbreaks in man and beast which blacken the history of past ages." What was done in the cases reported by Prof. Law to check the disorder remains to be noted. One hundred of the best steers were turned on a higher pasture with a gravelly subsoil. The remainder were, of necessity, left in the higher of the two meadows formerly occupied, but were fenced out from the swamps and low meadows where the clay approached near to the surface. Antiseptic methods of treatment were used, and most of the cattle recovered. In the cases occurring in Salem county the bacillus anthracis was detected.

TEXAS, OR SOUTHERN CATTLE FEVER.

This is generally regarded as allied to anthrax, or splenic fever. Its classification cannot be said to be settled. It is not believed that

it has the same law of contagion as the malignant anthrax of Europe, or as similar outbreaks which occasionally occur in this country.

The disease, although communicable, is not regarded as contagious in the general sense. D. E. Salmon, D. V. M., a veterinarian of the National Agricultural Department, says:

“The real danger exists in the pastures or other grounds over which Southern cattle, whether sick or well, have traveled.” If other cattle are turned in the same pastures, or go along the same roads, they are liable to contract the disease. The sick animal does not, because of his sickness, impart the disease, but the apparently well Southern cattle seem to carry the contagion of the disease, and will impart it to the pastures in which they feed, or the roads on which they travel, although, even afterward, not showing it in themselves. It is even claimed that a sick Southern animal does not infect the pastures, while those from the South which have sickened by pasturage, or by driving on fields or roads infected by apparently well Southern cattle, do infect them. This would suggest the idea that it is only at a certain stage that the infective particle is transmissible. Also, it is believed that Northern cattle which have contracted it through road-driving or pasture will not impart it to other cattle, either directly or by means of pastures. We cannot yet regard the history of this contagion as so definitely settled. Two outbreaks, confined to Texas cattle brought into this State, have occurred this year—one in Salem county and one in Burlington county. No extension of the disease has occurred. It is therefore important to state what is to be done in such case, both so as to exercise due precaution, and to avoid unnecessary alarm.

The sick Southern cattle should be “quarantined upon the infected pasture,” where they cannot come within one hundred feet of other animals. They should be securely fenced upon the infected pasture until after a killing frost. Such as die should be buried beyond the reach of dogs. The question of slaughter must be left to local authorities, but by most, this is not considered necessary in order to check the extension of the disease. Until more settled views are entertained, we recommend the same course in case of native cattle which may have contracted the disease. It is not necessary to quarantine all the cattle, but only those sick and the fields in which they are. Purchasers of Southern cattle should not allow other cattle, until after severe frosts, to be upon or go over the same ground on which they are left.

It might become necessary for a township to prohibit the bringing in of any cattle from districts infected with Texas fever. The danger is more insidious from the fact that the ground over which they pass or the excretions they leave upon it impart the disease. The "ticks" which are found upon the cattle may help in determining whence they came, but they have no relation to the disease.

There is no specific treatment known for the disease. The usual course of veterinarians is to give oils or mucilaginous drinks and nitre, or some other form of diuretic, to relieve the dryness of the fourth stomach and the congested state of the alimentary tract, the congestion of the liver or spleen, and the bloody urine. Where there seems to be much pain, opium is freely administered. Many recover, but the relation of treatment to their recovery is not always known.

The meat of any animal affected with the disease is not fit for use. It shows putrefactive changes so marked as not even to be classed with the meat of some of the more diffusive contagions.

The former circulars of the Board contain information as to all the other communicable diseases which have occurred in the State for the past year.

REPORTS OF THE VETERINARY INSPECTORS OF NEW JERSEY STATE BOARD OF HEALTH.

REPORT OF THOMAS B. ROGERS, D.V.S.

(American Veterinary College.)

WESTVILLE, N. J., December 1st, 1882.

To E. M. Hunt, M.D., Secretary N. J. State Board of Health :

DEAR SIR—Herewith I send you an account of the condition of health of the live stock of Gloucester, Salem, Cumberland, Atlantic and Cape May counties during the past eleven months of the year 1882. Fortunately for the State and the stock owner the report is almost entirely negative in character, as far as diseases, contagious or infectious, are concerned. Southern New Jersey has been entirely free from contagious pleuro-pneumonia, almost free from anthrax or its congeners, as also from swine plague.

Two cases of glanders occurring in Salem county were, on my recommendation, promptly destroyed, and the premises disinfected. This outbreak was clearly traced to its origin—the purchase of a horse from a Philadelphia car stable.

Isolated cases of “Texas fever” have come under the notice of your Board in Salem county, but the disease was arrested readily and with little loss. The losses from chicken cholera have been heavy, although not as heavy as they were last year.

It is proper to call the attention of your Board to the fact that this excellent bill of health is not due to any effort of your inspector, or to care in the selection of stock by the farmer ; it is simply an almost unparalleled run of good luck. The prevention of pleuro-pneumonia is beset with difficulties. Ferry inspection is useless ; the disease cannot be detected in its incubative stage ; the examination must of necessity be superficial ; the permit gives a false sense of security. A somewhat extended experience has convinced the writer that some

symptoms on which much stress has been laid in the differential diagnosis of this disease, are overrated in importance: the cough is a dry cough, a cough of irritation, no more; the crepitus over which so much fuss is made as being pathognomonic of pulmonary inflammation is certainly present in cases where no pneumonia exists. I have verified this statement several times on *post mortem* examinations of suspected cattle. Unless the farmer is content to help the State by isolating new purchases until they prove to be healthy, we shall never rid ourselves of this plague. The subject of inoculation should be closely studied, and may become a necessary measure. The presence of Texas fever in several parts of this State constitutes a new cause for alarm, and its study on our own soil opens up a new field of inquiry. There is a diversity of opinion as to its nomenclature or (disease-naming) character, and as we are all entitled to an opinion, mine is strongly in favor of its anthracoid nature. When all that has been written respecting it is well "boiled down," it resolves itself into something like this: *To the distributors, the Texans, it is not very fatal; the same thing may be said relative to pleuro-pneumonia on the steppes. It advances ringworm-like, with an angry border line and diminished central intensity.* The same simile may be applied to many other contagious diseases. *It is not communicated by direct contact, but by animals grazing after Texans, or passing over the same paths.* This looks very singular. Good observers unite on this point, though to my mind it is not yet a *fact* of medicine. We are still entitled to a verdict of "not proven." *Should it be true, it would appear that there is a period in the existence of the supposed contagium vivum, when it is destroyed by being received into the higher animal economy.* This may well be; there is no reason why the metamorphoses of the lower forms of life should be more confined than in the higher.

Another peculiarity cited is the increased resistance to frost shown by the disease in its journey northward. It would be singular if this were not so. There is no reason why this microscopic entity should not be subject to the laws of the conditions of life and acclimatization, to which all living things submit.

HORSE EPIZOÖTIC.

Of more importance to our farmers, is that now almost perennial scourge, the horse epizootic (influenza, pink-eye, horse distemper).

And I shall make no apology for introducing here a concise account of this disease for the benefit of the agriculturist.

Causation of Influenza.—This has been variously attributed to peculiar atmospheric or telluric conditions or to the presence of the influenza germ. It has always appeared reasonable to me to consider this disease as due to some altered constitution of the atmosphere causing directly the diseased condition, or may be allowing a germ always present, but not always potent, to become active. The rapidity with which an epizootic spreads, traveling over many miles in a few hours, seems to point to a cause somewhat different from that of a disease transmitted alone by germs, conveyed from place to place by currents of air.

Definition.—Influenza is an infectious fever of typhoid character, marked especially by a greatly elevated temperature (106° F., in this disease is not uncommon or alarming,) and muscular debility early manifested; the local lesions vary greatly; the most common form is catarrhal. This may be complicated with inflammation of the pharynx, giving rise to a difficulty in swallowing, more observed in swallowing water than solid food. This difficult deglutition of fluids may be diagnosed from the inability to swallow, usually seen in cerebro spinal meningitis of the horse, by observing the manner in which the animal attempts to drink. In influenza the horse drinks in a natural manner, the fluid being often returned through the nostrils; in cerebro spinal meningitis the horse cannot “trough” his tongue, and while plunging his head up to the eyes in the bucket does not swallow a drop. Another complication of catarrhal influenza is inflammation of the upper part of the air passages, laryngitis. This is perhaps the most dangerous complication we meet with; if severe it will call for the operation of tracheotomy; if mild in type it is often neglected, and through thickening of the laryngeal cartilages so diminishes the aperture as to cause permanent unsoundness—roaring. These cases should always have the throat blistered at once, and severely. Another form sometimes prevailing is the *gastro-intestinal* of the continental writers, severe catarrh of the whole intestinal tract sometimes causing jaundice through closure of the hepatic ducts; there is entire loss of appetite, the visible mucous membranes are tinged with yellow, the bowels constipated at first, and later, often unduly relaxed. These cases should never be purged, as the purging may become unmanageable, and terminate in inflammation of the bowels and death. If it is consid-

ered absolutely necessary to move the bowels, linseed oil should be given. Another form is the catarrhal rheumatic (pink-eye), severe catarrh, pain in the joints and swelled legs, the conjunctiva is pink in color, and, in some cases, there is a pink eruption in patches and spots on the mucous membranes of the nose; in some cases the head swells. The swelling of the legs is due to a passive dropsy arising from weakened action of the heart, and it often persists after the animal is apparently well.

I have seen intercurrent pleurisy in several cases of pink-eye, and this is a most dangerous complication, as the weakened heart's action, increase of fibrin in the blood, hyperinosis and interference with the oxygenation of the blood, all tend to produce death by the formation of heart-clot. The usual lung complication is congestion—hypostatic—not inflammatory.

Prognosis.—This is usually favorable. I think death is more frequently due to improper, debilitating treatment than to the disease.

Treatment.—The horse should have perfect rest; should be tempted, if possible, to eat; the circulation in the extremities should be stimulated by the application of mild liniments and flannel bandages; the throat should be promptly blistered, if sore (the cerate of cantharides of the pharmacopœia, with sufficient sweet oil added to make it rub in easily, is the proper blister); tonic and stimulative medicines should be given; it is, however, to the owner's advantage to consult a qualified veterinarian in all severe cases. It is well to recollect that influenza is a self-limited disease; it cannot be cut short by medical interference. The province of the veterinarian is to support the animal—to look out for and avoid complications.

Remarks.—One attack does not give immunity from a second; the question of its contagious nature is not settled, though my own opinion is that it may be conveyed to a healthy stable by a sick animal. My clinical experience goes to prove this.

Prevention.—Do not overwork; see that the drainage and ventilation of the stable is good; whitewash with lime containing a little carbolic acid. The food should be of a character not to injure the membranes of the mouth and throat, as any sharp particles may remove enough of the membrane to allow lodgment of the morbid material; hence, hay should be sprinkled with water, and cracked corn and bran fed, in preference to oats and corn on the cob, during the prevalence of an epizootic; isolate the sick, and do not let them drink from a bucket or trough common to all the horses.

The formation of county boards of agriculture in connection with the State Board is a step in the right direction ; and I would suggest to you and to them that they place themselves in communication with your district veterinarians and make them members of the local boards. A few lectures during the winter months would do much toward increasing the knowledge and usefulness of these local boards on questions relative to the general welfare of their stock, and the opportunities thus afforded to your veterinarians would keep them better informed as to the sanitary condition of the districts over which they have a *quasi*-charge. Let me beg of you, in conclusion, to use your influence to increase the value of veterinary supervision to the farmers of this State by the appointment of four or more well qualified men as your district veterinarians throughout the State. This could be done at an expense not exceeding \$1,500 per annum, and it would save the State the loss of a much greater amount of taxable property every year.

REPORT OF JOHN A. McLAUGHLIN, D.V.S.

126 NEWARK AVE., COR. GROVE ST.

E. M. Hunt, M.D., Secretary State Board of Health :

SIR—As requested, I forward report of work done by me in the position of Veterinary Inspector to your Board, for the year 1882.

I am pleased to report but one outbreak of pleuro-pneumonia contagiosa, which occurred in Pinebrook, on the farm of Dr. O'Callahan, early in the year. The herd consisted of over one hundred head. I destroyed eight on my first visit and one more on a subsequent visit. Present reports say the animals are all healthy.

I have released from quarantine cattle imported by Mr. I. F. Sadler, Jersey City ; Mr. Foote, of Morristown ; Mr. Satterthwaite, of Stilt's Station, and F. H. Relph, of Preakness.

When cattle were intended to leave the State I gave passes, after a satisfactory examination.

Various reports have reached me of anthrax and typhoid fever. I have not seen a case of either in the State of New Jersey, nor have I heard of one that I could substantiate.

REPORT OF WM. B. E. MILLER, D.V.S.

For the year beginning November 1st, 1881, and ending December 31st, 1882.

December 6th, 1881. Visited Gloucester county in company with Dr. T. B. Rogers, for the purpose of examining a herd of swine; killed and made a *post mortem* of one pig, and found all the *post mortem* appearances of swine plague. The case was reported to you by Dr. Rogers.

December 7th, 1881. Visited the slaughter-house at Fifth and Germantown road, Philadelphia, Pa., to witness the slaughter of some bologna cows, brought from Elmer, Salem county, and Mount Holly, Burlington county, New Jersey, by one Levi Bachrack, butcher and drover. There were eleven in the lot when examined at the ferry yards, two of which I thought to be chronic cases of contagious pleuro-pneumonia. The appearance of the lungs and the pleuro adhesion at the time of slaughter fully confirmed my opinion.

December 9th, 1881. I detected a steer with acute lung trouble in a small lot that came to the ferry yards, driven by William Smith, cattle drover. From the information given, they were from Baltimore, Md. Knowing that to be an infected locality, I went with them to the slaughter-house and witnessed the butchering of the animals. The lesions were not sufficient to warrant a decided diagnosis of contagious pleuro-pneumonia.

On the 13th of December, 1881, I discovered three cows with chronic lung lesions, and on the 17th of December, I found another. These animals came from Gloucester county, and from Haddonfield, Camden county, and were purchased for bologna beef. They were otherwise healthy looking and were fat. They were taken to slaughter-house, Fifth and Germantown road.

On the 27th of December, four young animals were bought from Walker & Co., dealers, of Philadelphia, and brought over the West Jersey ferry. I thought best to order them to be returned, as I believed them to be affected with phthisis pulmonalis verminalis.

On the 21st of January, I was ordered by Justice Cassady to examine two horses, supposed to be affected with glanders. Visited the localities where they were kept and made a thorough examination, the result of which was the condemnation and destruction of both animals.

On the 2d of February I visited the stable of Mr. Powell, living

in the outer portion of Camden, for the purpose of examining a sick cow. The animal was suffering from pneumonia, and as she had been running at large upon the public commons during the entire summer and fall, and had necessarily been thrown in contact with the *Logan* cow and others reported last summer, I very much inclined to the opinion that it was a case of contagious pleuro-pneumonia. This animal died about one week after the time of visitation; another had also died about a month previous to time of visitation, neither of which was opened after death.

On the 6th of June I visited a stable in the rear of C. McCrellish's livery stable, New Brunswick, N. J., and examined a cow suffering from lung trouble; as she was the only cow owned by the parties, there was no danger of any spread of it should her disease prove to be of a contagious character; she was, therefore, ordered to be kept within the stable and her case reported to you.

On the 29th of July I visited Mercerville, Mercer county, in accordance with instructions from you, and examined into a case reported as pleuro-pneumonia, on the farm of Mrs. Julia Moore; the animal had died about a week prior to time of visitation; it had been attended by a local cow doctor who pronounced the case one of pleuro-pneumonia. From the description given by those who saw the case, and by Mrs. Moore herself, I think he was correct in his diagnosis. The cow had been purchased in Trenton, some time in April.

On the 16th of August I visited Manalapan, Monmouth county, New Jersey, accompanied by A. C. Doyle, D. V. S., of Hightstown, in accordance with instructions from you.

I examined all the stock owned by Leonard Du Bois which had been reported as infected with pleuro-pneumonia. I could find no evidence of any contagious disease existing among them, and the opinions of both Dr. Doyle and myself were that they were a remarkably healthy herd of cattle. The report had evidently originated from the fact that he had lost two cows during the hot weather from ordinary causes.

On the 15th of September I visited Salem county, New Jersey, in response to instructions from you to go and investigate the reports of a disease of cattle existing in that county near Salem City. At the time of the visitation the animals appeared to be in good, healthy condition, although several deaths had taken place among cattle owned by Kelty & Harris, Mr. Lounsbury and others. The matter had

been kept quiet, fearing that it might injure the traffic in cattle or beef. Dr. Cooper, a veterinary surgeon practicing in Salem, informed me that there were various opinions as to the cause of death, some claiming that it was pleuro-pneumonia; others, anthrax; others, that they were poisoned, and various other causes. Dr. Cooper had not attended any of the cases. He was informed, however, that a veterinary surgeon from Philadelphia had been called to attend them, and had made a *post mortem* examination of some of the carcasses. These animals were mostly all pastured on the low lands adjoining Salem creek. From the information obtained, I could form no decided opinion as to the infection from which the animals had died. Dr. Cooper promised to inform me should he hear of any more being sick, in order that I could go and see the animals myself, but, as yet, I have received no such information. (The cases were Texas fever.)

On the 18th of September I visited Glassboro', Gloucester county, in response to a postal from Mr. Arthur Downer; obtained the following history from Mr. Downer: "About two weeks ago I lost a cow that had been sick about a month, during which time she discharged at the nose, had a severe but dry cough, and from the time of first appearance of any difficulty gradually grew worse, until she died." Three days before he wrote me, or about a week prior to time of visitation, another sickened with similar symptoms, and at the time of visitation was still sick, but much better, apparently, than when he wrote. I examined this animal, which I found to be suffering from considerable *bronchial trouble*, but with very little difficulty at the lungs. Decided that the case had been a severe form of bronchitis; recommended treatment from which I was afterwards informed the animal made a rapid recovery.

On the 13th of November, in response to an order, I visited the farm of C. Albertson's Sons, situated in Camden county, about eight miles from the city of Camden. A cow had died quite suddenly on the previous day, having been sick but a few days apparently. She had been opened in the presence of several persons who were present, soon after death, and all were surprised at the appearance of the lungs, which were enormously enlarged, and the owner was informed by some one present who had seen pleuro-pneumonia, that it looked very like this case. At the time of my visitation, twenty-four hours after, decomposition had set in, and the lung substance had changed very much in appearance, so that it was almost impossible to make a correct

diagnosis. The lungs were both very much engorged, enlarged and solidified, and false membranes had formed between the pleura and its surrounding tissues. For safety, therefore, I quarantined the entire herd of cattle, composed of twenty-one head, several of which were coughing severely, and two of which were sick. At a subsequent visitation, on the 17th, in company with yourself and Dr. T. B. Rogers, one of the animals was slaughtered, but the case was of so recent infection that the lung lesions were not very plainly marked, and the *post mortem* was not therefore very satisfactory. For safety to the other animals, two that were affected with a cough were placed in close quarantine, and the others were ordered to be kept away from any of the neighbors' cattle. At a further investigation, made on the 12th of December, I received information that the animals appeared to be all doing well.

REPORT OF J. W. HAWK, D.V.S.

NEWARK, January 2d, 1883.

E. M. Hunt, M.D., Secretary Board of Health of N. J. :

SIR—According to request I submit the following report of work done by me since my appointment as inspector.

May 22d. I visited the farm of Thomas Vincent, Orange Mountains, Essex county. There had been one chronic case, but all were in a healthy condition at time of visit. The cattle took sick late in the fall, when three died.

May 24th. Visited herd of cattle belonging to Mr. Culberson, East Orange. Found one chronic case.

May 24th. Visited herd of cattle belonging to Booth & Dorr. Found three chronic cases.

June 5th. Visited herd belonging to Mr. Thomas Johnson. It contained eleven cows. I quarantined the herd, and had one cow killed.

June 5th. Went to see herd of cattle belonging to Mr. Hess. It contained fourteen cows. I quarantined the herd, and had two cows killed. Made other visits as required.

July 31st. Visited herd of cattle belonging to Mr. David Britton. It contained four cows. I appraised one and had it killed. Visited afterward when necessary.

August 28th. Had two horses killed at Irvington, suffering from glanders.

November 16th. By order of Dr. Hunt, Secretary Board of Health, I visited a herd of cattle belonging to Mr. Edwin Bishop, Denville, Morris county, and found it suffering from contagious pleuro-pneumonia. I had one cow killed, and quarantined the balance, which were five, and two calves, having a slight attack.

November 21st. I again visited at Denville and found the cattle doing well.

December 19th. By order of Dr. Hunt, I visited a herd of cattle belonging to Mr. Foster. I found them in perfect health, and released them from the quarantine. This was at Morristown.

REPORT OF C. K. DYER, D.V.S.

(Veterinary Inspector of the State Board of Health.)

MT. HOLLY, January 1st, 1883.

To Dr. E. M. Hunt, Secretary State Board of Health:

I have the honor of submitting the following report:

Called April 22d, 1882, to inspect a calf, property of John Lippincott, Vincentown, N. J., supposed to have been suffering with pleuro-pneumonia. *Post mortem* revealed a briar which had passed down the left bronchial tube into the lung, burrowed its way through the same, and protruded through the lung above three inches. The briar was nine inches in length. While living the calf presented all symptoms of pleuro-pneumonia.

Called April 29th, 30th, and May 1st and 2d, to inspect herd of cows, property of Mrs. Brown, Pemberton, N. J., supposed to be suffering with pleuro-pneumonia. It proved to be throat trouble only.

Called May 18th, 1882, at Mr. W. S. Taylor's, Burlington, N. J., to examine and certify as to the health of two cows and one calf that he wished to export.

Called August 24th, 1882, to inspect a herd of cattle, property of Mr. Joel Haines, Wrightstown, N. J. Found a steer suffering with splenic fever. Mr. Haines purchased of Mr. Samuel Johnson, Mt.

Holly, N. J., on the 14th of August, twenty steers and six heifers, and placed them with his herd consisting of thirteen cows and one bull. Steer died on the evening of the 24th inst., and *post mortem* proved the diagnosis. I immediately quarantined the herd. On the afternoon of the 24th, another steer was taken and died on the morning of the 25th. *Post mortem* same as case No. 1. I found three more steers and one heifer to be ailing, and isolated them and had them appraised as required.

Called the 26th, with Dr. Hunt, at Mr. Haines'; slaughtered one steer. Held *post mortem*, he confirming my diagnosis. By his order, I traced the remainder of Mr. Samuel Johnson's drove and quarantined them. I learned the cattle came from Crawford county, Pa., via Philadelphia, and laid in the stock yard over night.

Called the 28th, at Mr. Haines'; found one dead, slaughtered one and condemned one heifer.

Called 29th, at Mr. Haines'; slaughtered one steer and one heifer. No more cases occurred.

Called September 8th, 1882, at W. V. Read's, Manasquan, N. J., to inspect a cow supposed to have pleuro-pneumonia, but such was not the case.

Called October 22d, at Mr. ———, Cookstown, N. J., to inspect his hogs; found that two had died, the balance doing well.

Called October 23d, at T. S. Woolston's, Pemberton, N. J., to inspect his hogs; found several had died, and sixteen sick. Quarantined and isolated them as required. Most of them died.

Called October 28th, at Messrs. F. Keeler's, D. Wells' and Woolston's, to inspect their hogs. Messrs. Keeler and Wells each reported two had died and that no more were sick.

Called November 6th, to Mr. John G. Harker's, Columbus, N. J., to inspect a cow. Diagnosed it a case of pleuro-pneumonia. I learned he had purchased a calf from John Comfort (drover), about the middle of September, 1882, and placed it with the above-mentioned cow about the 20th of October. It sickened and died soon after.

Called November 7th, slaughtered the cow, held *post mortem*, which showed all the lesions of contagious pleuro-pneumonia.

VARIOUS PROCESSES BY WHICH FERTILITY IS RESTORED TO A SOIL EXHAUSTED BY CROPPINGS.

BY SIR JOHN B. LAWES, BART., LL.D., F.R.S.

I do not propose in the present paper to enter into any discussion in regard to the much-disputed question of the source of the nitrogen in plants. Assuming that the rain and dew furnish the soil with nitrogen, that the soil condenses ammonia, that plants assimilate free nitrogen from the atmosphere, and that some kinds of plants assimilate more than others; I am still disposed to think that the *main* source of nitrogen of our crops is to be found in the stores already accumulated in the soil.

I think that the atmospheric sources of nitrogen collectively, do not furnish as much of that substance as is removed in our crops; and that, in consequence, a soil continually cropped becomes, in the course of time, poorer and poorer in nitrogen.

Let us suppose, by way of illustration, that one of the richest soils in the States—which had never before grown a grain crop—yielded, as its first produce, 100 bushels of corn per acre. It is, of course, possible that the first season might be unfavorable for the growth of corn, and, if the next season proved more favorable, it is quite possible that the second crop might be larger than the first; but making all allowance for the disturbing influence of good and bad seasons, I am disposed to think that no combination of manures, unless it contained nitrogen, could prevent the crop from progressively declining; and further, that with the decline of the crop, it would be found that a corresponding decline had taken place of the nitrogen in the soil.

In such a crop as I have supposed, of 100 bushels per acre, with its accompanying straw, the atmospheric supply of nitrogen would be

very small, but, with each decline in the crop, the relation between the two sources would become closer, until a time would arrive when the decline of nitrogen in the soil might be balanced, or nearly so, by the nitrogen furnished from the atmosphere, and further decline in the crop be arrested.

In the example which I have brought forward, I do not attempt to assign a period of time that would be required to reduce the fertility of the soil to the point named, but I merely wish to indicate what I think would be the general result of growing corn upon a very fertile soil furnished with manures containing all the necessary food of the crop, with the exception of nitrogen.

It may possibly be said that, in taking a cereal crop for illustration, I have taken a class of plant which is said—by those who adopt the view that plants assimilate free nitrogen from the atmosphere—to take combined nitrogen largely from the soil.

The cereal grain crops, however, occupy so prominent a place in the agriculture of the States, that such an illustration as I have given would possess comparatively little interest if applied to any other class of crops. With certain explanations and modifications, I should, however, be quite willing to apply the same rule to all cultivated crops.

I have made these preliminary remarks, as they are essential to the object I have in view. I consider that, speaking generally, every farmer in the United States must look for the elements of fertility within the four sides of his own fields, rather than to any external sources; and such being the case, my argument will be directed mainly to the various processes by which the stored-up fertility in the soil may be utilized and economized.

Although I have adopted in the title of my paper an expression which is in ordinary use, it is evident that in the various processes discussed, I do not actually aim at any *restoration* of fertility. I consider that in all the operations of agriculture the fertility of the soil declines; but that we have considerable influence over the rate at which this decline takes place. My contention is that the removal of fertility from a soil is not only legitimate, but also that by no other process can profitable agriculture be carried on in the States.

It might be as well argued that the owner of a gold or silver mine should put back the extracted metal, as that the stores of fertility existing in our soils are not to be utilized.

The analyses of the various soils at Rothamsted, which have been under experiment for long periods of time, indicate that although very large crops can be grown continuously with artificial manures composed of alkalis, phosphates and soluble nitrogen, the soil either remains stationary, or even declines in fertility. But if the same crops are grown with barnyard manure, in which the nitrogen is in combination with carbon, the soil then increases in fertility. The same fact is very apparent in garden cultivation, which has been carried on for a considerable time; the increase of the stock of fertility in such a case becomes very large.

It is a fact of considerable interest that at Rothamsted, where we have applied dung yearly to our soils for many years, and have thus largely increased the stock of fertility, the relation between the carbon and nitrogen is almost the same as that which exists in other parts of the soil which have either received no carbon in manures, or have been kept entirely without manure.

The relation between the two substances does not at all resemble that which exists in living vegetation; but in the close relation between the natural fertility which we find stored up in soils, and that which is formed when barnyard manure is used in large quantities, we have no difficulty in tracing the former to the decay of trees, or to some other vegetation which previously grew upon the surface. We also obtain some idea of the great value of natural fertility.

In the last forty years above 600 tons of barnyard manure have been applied to one acre of land. This application has doubled the carbon and nitrogen in the first nine inches of the soil, restoring partly that which has been removed by cropping since the land was first cultivated, though it has not brought the soil up to its original state of fertility, nor to that which still exists in the ordinary pastures.

When we see that the partial restoration of the removed fertility to the first nine inches of the soil has taken 600 tons of dung, at a cost, I presume, of not much less than one dollar per ton by the time it is carted and spread upon the land, we have no difficulty in understanding that natural fertility is cheaper than all artificial substitutes, and that those who cultivate newly broken up land can produce crops cheaper than any one else.

Although not strictly accurate, it will be sufficiently so for my purpose if I say that there are two sources from which our ordinary agricultural crops derive their food: (1) The atmosphere, whence they

get their carbon and water ; (2) the soil, which supplies the mineral matter and nitrogen.

Of the various crops in the dry state, it may be said that the atmospheric portion comprises from ninety to ninety-five per cent. of the whole, and the soil portion from ten to five per cent. If, instead of taking the gross crop grown, we take the separated portions, it will be found, as a general rule, that the more the atmospheric constituents predominate, the higher is the commercial value of the whole crop, and the same rule will apply to all animal products; for instance: fat meat is more valuable than lean meat; whole milk cheese is more valuable than skim milk cheese, and fine flour than whole meal flour. In all these instances the soil constituents are lower in the products which bear the higher money value; but it is in such products as butter and sugar, which are exclusively atmospheric compounds from which all soil constituents have been removed, that we find substances of the highest money value.

It is true that there are products which contain a large amount of soil constituents and also have a high money value; among these are comprised tobacco, tea, coffee and garden vegetables; it may be said, however, that their cultivation is conducted under special circumstances, differing altogether from those of ordinary agriculture.

It would appear from the high value placed upon purely carbonaceous compounds, that where man is in a position to select his diet, he prefers taking his respiratory vegetable food with very little admixture of nitrogen and minerals, and that he supplies himself with these latter substances, as they are found in meat, vegetables and the beverages which he drinks.

The following table gives approximately the relative proportion of soil and atmospheric ingredients in 100 parts of various products in their dry state:

	SOIL INGREDIENTS.	ATMOSPHERIC INGREDIENTS.
Leaves.....	28 to 15	72 to 85
Bulbs.....	12 to 5	88 to 95
Hay.....	10 to 8	90 to 92
Straw.....	8 to 6	92 to 94
Grain.....	5 to 3	95 to 97
Sugar.....	None	100
Butter.....	None	100

IN THEIR NATURAL STATE. *

Lean animals.....	7	93
Fat animals.....	3	97

A very slight examination of this table will show that a farmer, in the selection of the substances to be produced upon his land, has a great command over the stores of fertility which it contains.

A relative, upon whose information I think I can rely, informed me that in New Zealand there are soils which, without any application of manure, would grow fifty tons of mangels per acre. The fortunate owner of such a soil, in the selection of the crop he should grow, would take that which would command the highest value, quite irrespective of any question of exhaustion; it might be tobacco, or cabbages, or mangels. In the course of time, however, crops of this exhausting character could no longer be grown, and the farmer would then be compelled to have recourse to those of a less exhausting description; as, for instance, corn, wheat, oats and barley, which might continue to give a fairly good produce for a long series of years.

It is one of the peculiarities of the cereal crops, that they can obtain food from a soil whence other classes of plants would fail to extract a bare subsistence. This fact was illustrated in a remarkable manner in our permanently unmanured rotation at Rothamsted, where turnips were taken every fourth year, succeeding wheat, and followed by barley. In the second rotation the turnips were unable to form a bulb, and from that time to the present they have never produced the semblance of a crop, and it is quite certain that the land will never grow another, although about seven fairly good crops of wheat and an equal number of crops of barley have already been taken from the same soil, and, in all probability, a great many more may follow.

But a time will come when the farmers in the United States will find that even grain crops will fail to give the expected return, and they will then be brought face to face with the question, not, as is generally supposed, of how to restore the lost fertility of the soil, but how to make the best use of the remaining stores of fertility still existing there.

If a farmer had access to a table showing the respective amounts of soil and atmospheric constituents removed by vegetable and animal products, he might say "100 pounds of a fat animal worth \$5 removes only three pounds of soil constituents, while the same money value of grain removes very much more; why then should I not convert some of my grain into meat, and instead of burning my straw, or leaving it in heaps to rot, why not use it as litter, and return it to the soil, so that the straw of one year may become grain at some future time?"

He might also call in the aid of such deep-rooted plants as red clover and lucerne to tap the fertility of his subsoil, and if there was no demand for meat, such crops might be plowed down.

In the above instance I have assumed the case of a farm which, from a very high state of fertility, has gradually lost a considerable amount of its original stock ; and I have pointed out the processes by which the stock still remaining in the soil could be more economically utilized. I have assumed, however, from beginning to end, that the cultivator did not have recourse to any sources of fertility outside his farm.

I propose, now, to consider what external sources of fertility exist and how far they are practically available.

With regard to the manure made in towns, it can hardly be said that its use forms a part of practical agriculture. Those living near towns or railways, who alone can have access to such manure, are usually market gardeners, and those who furnish the towns with fruit and vegetables. A person who has access to purchased manures of this description can grow any crops he chooses to select ; as, instead of his land becoming poorer in fertility, which is the case in ordinary agriculture, it is becoming constantly richer.

The farmers of Great Britain have lately been advised to turn their attention to the growth of vegetables on account of the low price of wheat. Those who give this advice know but little of the subject on which they are writing, and how impossible it is for any one to carry on garden cultivation profitably who is dependent upon the manures made upon the farm.

In almost all soils the amount of food available to the growing crop is unequally balanced—there is too much of one substance and not enough of another. It does not either follow that the ingredient which is either available or deficient for one kind of crop, is equally so for another. This difference is due to the different capacity which the roots of some plants possess, as compared with others, of extracting food from a soil.

We cannot explain in any other way the fact that, in our unmanured rotation, the wheat which preceded, and the barley which succeeded the turnips, were able to take sufficient alkalies and phosphates from the soil to produce fair crops, while the turnips—since the first crop in the rotation, which was fairly good—have never been able to do so, and, in fact, have become mere weeds.

Here, I may allude incidentally to another instance of the different capacity of plants for extracting food from the soil, in the case of clover, which in the United States appears to have benefited largely by the application of plaster; where such was the case, it is evident that the constituents in which the soil was deficient were sulphur and lime.

In writing upon the agriculture of the States, extending as it does over so vast an area, containing soils of every possible degree of fertility and exhaustion, any attempt to lay down rules for manuring would savor very much of charlatanism; at all events no such attempt will be made by me. I may, however, venture upon a few general remarks, which I think will be useful to those who have not had much experience in the use of artificial manures.

With regard to combined nitrogen, which I have said is the element more generally deficient in grain-cropped soils, sooner or later all substances containing nitrogen are converted into nitric acid. With some substances this process is very slow; in the case of bones or shoddy, for instance, it may be many years before they finally assume this form; while with salts of ammonia on the other hand, the process is very rapid, as they are changed into nitric acid in the course of a few days, if the soil be sufficiently moist.

Until the nitrogen assumes the form of nitric acid it is comparatively inactive, and, when formed, the nitric acid is subject to severe losses; it is washed out of the soil by rain; it is destroyed if oxygen be absent, or if it comes in contact with an excess of organic matter, and for this reason it always does less work than it is competent to perform; or to put the matter in other words, the amount of nitric acid placed on the soil can never be all recovered in the crop.

Let us suppose, for instance, that a farmer wishes to add five bushels per acre to his wheat crop; this amount, with its equivalent of straw, say 500 lbs., and the 300 lbs. of grain, would contain somewhere about one per cent. of nitrogen, say eight pounds; now eight pounds of nitrogen added in the form of salts of ammonia, or nitrates, would certainly not give this increase, probably not one-half of it, and if the season happened to be an unfavorable one, possibly very much less than one-half. For these reasons considerable caution must be exercised in the use of such costly compounds. I am myself inclined to think that the phosphates will be found far more satisfactory substances to use, and that probably a mixture of very finely ground

Charlestown phosphate, and superphosphate would give generally a better return for the outlay than anything else.

With regard to what are called complete manures, that is to say, manures which furnish all the minerals and nitrogen that the crop requires, I must express my doubts whether the ordinary crops of the farm can be grown in the States by them with profit. At all events, if manures of this kind are required, I am of opinion that they can be obtained much more economically by means of feeding stock on cotton meal or cotton cake, than by their direct application in the form of artificial manures.

I estimate that the excrements of an animal consuming 2,000 lbs. of decorticated cotton cake would contain the following constituents:

Nitrogen equal to ammonia.....	142 lbs.
Phosphoric acid calculated as phosphate of lime.....	133 lbs.
Potash.....	60 lbs.

These substances would be found, principally, in the urine as soluble salts. I presume that this cake can be purchased in the States at \$30, or possibly less than this sum, per ton. It is tolerably certain that an equivalent in artificial manures containing soluble nitrogen, phosphoric acid and potash would cost considerably more than the cake, besides, in cake fed by stock, a certain amount of its cost is recovered in the increased value of the animal consuming it, which, of course, further reduces the price of the manure.

Whether crops can be grown profitably by means of complete artificial manures is a question which has never yet been answered; but the process is, in any case, very different from that of growing crops by the aid of artificial manures, and drawing upon the resources of the soil to furnish, out of it surplus, one, two or more ingredients.

Practical experiments alone can find a solution to the question.

SIR JOHN BENNET LAWES.

Mr. John Bennet Lawes, F.R.S., F.C.S., LL.D., who has just been created a baronet, was born in 1814, and succeeded to his estate of Rothamsted, in Hertfordshire, in 1822. Mr. Lawes was educated at Eton and at Brasenose College, Oxford, where he remained from 1832 to 1835. During his academic career he displayed at once a strong partiality for the laboratory, and on leaving the University, spent some time in London, for the purpose of studying in a practical manner the science of chemistry. Possessed of independent means, a handsome property, and a beautiful old manor-house and demesne, Mr. Lawes at once interested himself in agriculture. In October, 1834, he first commenced regular experiments in agricultural chemistry on taking possession of his property and home at Rothamsted, and from that date up to the present time Mr. Lawes has unceasingly been applying his scientific knowledge to the solution of questions affecting practical agriculture. In the commencement of his experiments, among other subjects, the effect of bones as a manure on land occupied his attention for some time. A friend and neighbor, the then Lord Dacre, particularly directed his notice to the fact that bones were very variable in their effect in different soils. Several hundred experiments were accordingly made, some upon crops in the field and others with plants in pots, in which the constituents found in the ashes of plants as well as others were supplied in various states of combination. Striking results were gained from these experiments, in which the neutral phosphate of lime in bones, bone-ash and apatite were rendered soluble by means of sulphuric acid, and the mixture applied for root crops. The result obtained on a small scale in 1837-8-9 were such as to lead to more extensive trials in the field in 1840-1, and to the final taking out of a patent early in 1842. This being done, Mr. Lawes established large works in the neighborhood of London for the manufacture of superphosphate of lime, by which name the manure is known, which has produced such a revolution in the science of agriculture.

Not content with the individual profit which he derived from his investigations, Mr. Lawes continued his work with the assistance of a practical chemist. In 1843 he engaged the assistance of Dr. Gilbert, the present director of the Rothamsted farm, and undertook with him a systematic series of agricultural investigations in the field, the feeding-shed, and the laboratory. The laboratory consisted, first of an old barn, but this very soon became insufficient for the growing requirements of the new science. Happily, an opportunity offered to build another one. In 1854, a testimonial was subscribed for presentation to Mr. Lawes, to express the appreciation of the services he had rendered to British agriculture. The committee proposed to expend the money in plate, but Mr. Lawes at once suggested that it might be devoted to providing a new laboratory which would enable him the better to prosecute and extend his inquiries, the publication of the results of which would be the best return he could make for the honor that had been conferred upon him. Mr. Lawes was elected a Fellow of the Royal Society in 1854, and in 1867 the royal medal was awarded to him conjointly with Dr. Gilbert, by the council of the society. Mr. Lawes has also received a gold medal from the Imperial Agricultural Society of Russia. Last June the Emperor of Germany by imperial decree awarded the gold medal of merit for agriculture to Mr. Lawes and Dr. Gilbert jointly, in recognition of their services for the development of scientific and practical agriculture. The honor, therefore, which has been recently conferred upon Mr. Lawes is merely a final and national recognition of his reputation and lifework.

The results of the Rothamsted investigations are to be found in the "Journals of the Royal Agricultural Society of England," the "Reports of the British Association for the Advancement of Science," the "Journal of the Chemical Society of London," the "Proceedings and Transactions of the Royal Society of London," the "Journal of the Society of Arts," the "Journal of the Horticultural Society of London," the *Edinburgh Veterinary Review*, the "Reports of the Royal Dublin Society," the *Philosophical Magazine*, the *Agricultural Gazette*, the *Chemical News*, and in official reports and scattered pamphlets and newspaper letters.

Rothamsted is situated some twenty-five miles from London, in Herts, and is easily accessible to visitors, Harpenden being the railway station. Mr. Lawes' manor-house is a remarkably fine specimen of old English architecture, and the demesne surrounding

it contains some magnificent timber, including an avenue of limes, which for size and regularity of dimensions are perhaps unsurpassed in the south of England. Around the family mansion lie the 500 acres which form the experimental station of agricultural research, with which Mr. Lawes' name is so intimately connected. It is not only entirely maintained by him, but he has further set apart a sum of £10,000 and certain areas of lands for the continuance of the investigations after his death. The staff of skilled and scientific labor is very considerable, including often three chemists, two or three general assistants, a botanical assistant with several boys under his supervision, three computers and record keepers, and a large permanent laboratory staff. There are now stored in the laboratory about 30,000 bottles of samples of experimentally grown vegetable produce, animal products, ashes and soils. The field and feeding experiments, including the making and application of manures, the measurement of plots, the harvesting of crops, the taking of samples, the preparation of them for preservation or analysis, all these involve the employment of a large quantity of agricultural labor. In this connection, it may be mentioned that Mr. Lawes, for the benefit of his laborers, formed some years ago an allotment club, through which small gardens about the eighth of an acre can be rented. For this purpose sixteen acres of land have been allocated, and the total number of allotment gardens now in cultivation is 174. A club house is erected on the allotment area.

The scientific discovery around which all Mr. Lawes' subsequent work centered was the disprovment of Baron Liebig's celebrated mineral-ash theory. At the time the Rothamsted experiments commenced it was generally supposed that certain saline bodies, so-called mineral constituents, were essential to the growth and development of the plant, and that such substances must be furnished to it by the soil. The necessity of a certain quantity of nitrogen was also recognized, but it was imagined since wild plants could thrive without any artificial supply of nitrogen, that a sufficient amount of this element existed in the atmosphere to render it unnecessary to take any steps for increasing this supply. In fact, the absolute necessity of the presence of nitrogen (naturally or artificially supplied) in land in order to maintain the fertility of the soil was the cardinal discovery made by Mr. Lawes. Formerly it was supposed that the fertility of a soil might be maintained for an indefinite period if the different mineral

constituents carried off by the crop were annually returned in due quantity as mineral manure to the soil. This theory only embraced part of the truth. In his last work upon "Fertility," Mr. Lawes thus speaks of the great problem of the sources of nitrogen :

"I maintain that the amount of nitrogen supplied to our crops from the atmosphere, whether as combined nitrogen brought down by rain or that absorbed by the soil, or the plant, constitutes but a very small proportion of the total amount they assimilate, and that the soil itself (or manure) is practically the main source of their supply. Indeed, it is a question whether on arable land as much or more may not be lost by drainage or otherwise than is supplied by the atmosphere."

The field experiments on which these conclusions rest have, indeed, formed Mr. Lawes' principal work. Favored by position and circumstance, he has been enabled to carry out on a large scale most important operations. It would be impossible to go into the subject exhaustively. Commencing in 1843, fourteen acres, divided into about twenty plots, were devoted to experiments in wheat, and seven acres, divided into twenty-four plots, to experiments upon turnips. Subsequently similar experiments were made upon beans, clover, barley, and the mixed herbage of permanent meadow land. The general plan was to select fields in a condition of agricultural exhaustion—*i. e.* in a state in which a fresh supply of manure was needed to fit the soil for the growth of another crop. Upon this exhausted soil each of the most important crops in the rotation were grown year after year upon the same spot, both without manure and with many different descriptions of manure, each of which was, as a rule, applied yearly to the same plot. Thus it became possible to determine the point of relative exhaustion or excessive supply of any of the constituents of the manure. Wheat has now been grown at Rothamsted for thirty-eight years in succession, turnips (with an interval of three years) for twenty-five years, barley for thirty years, and so on. The practical value of these experiments is obvious even from one fact that, taking the results of, say twenty years, the annual average produce in bushels of wheat per acre, without manure, was sixteen and one-quarter, with farmyard manure exactly double, and with artificial manure thirty-five and three-quarters bushels. Mr. Lawes, however, soon found that much remained to be done in perfecting the methods of chemical analysis before comparative analyses could afford much assistance in

determining the relative productiveness of different soils, and to this he applied himself with great skill and success. Even after all his investigation Mr. Lawes believes that the elucidation of agricultural principles must be looked for from a due consideration of vegetable physiology as well as chemistry, of the special functional peculiarities and resources of different plants, as well as their actual percentage composition. The explanation of the distinctive functions of crops grown in rotation, he contends, are found in the character and length of life of the different plants; in the character of the roots in regard to number, range, size, &c., and to their aptitude to derive more of their food and moisture from the surface or from the subsoil; finally in the greater capacity of some for liberating and assimilating food not available for others, or for arresting food which would otherwise be washed out of the soil. Briefly, then, Mr. Lawes' investigations have embraced (1) researches into the exhaustion of soils, including experiments on crops; (2) researches on the principles of rotation and fallow; (3) on the mixed herbage of grass lands; (4) on the process of vegetation generally, including researches on the action of manures; (5) on the origin of nitrogen in plants; (6) on the feeding and fattening of cattle, and, generally, on stock as meat-producing and manure-making machines; (7) on rain-fall and drainage; (8) on botanical characteristics; and (9) on the chemistry of the malting process, and the comparative value of malt and barley as food for cattle. Besides this Mr. Lawes has, in conjunction with Professor Way, acted upon a Royal Commission, appointed in 1857 and extending to 1865, in which an extensive investigation was undertaken on the application of town sewage to different crops, but especially to grass. Comparative experiments were also made under this commission on the feeding qualities of the differently grown produce; the amount of increase yielded by oxen, and the amount and composition of the milk yielded by cows being determined. It is interesting to note that Mr. Lawes contended on economic grounds, from the outset of the agitation for the repeal of the malt tax, that its abolition would be of no benefit to the farmer, and his opinion is now generally adopted by the farmers themselves.

The last utterances of Mr. Lawes upon agricultural topics have considerable political significance. They were published in the *North British Agriculturist* last month, and are observations on the Scottish Chambers Land Bill. Mr. Lawes, in 1870, published his views on

the valuation of unexhausted manures, and, in 1873, wrote an interesting pamphlet on the same subject with reference to the Irish Land Act of 1870. He has not altered his views since that time, and he combats the position taken up by the Scottish Chambers upon the questions of unexhausted fertility and of "manurial compensation" to out-going tenants. He says, "I am disposed to advise the Chambers of Agriculture to seek for a basis of compensation in the crops and the manure in the yard rather than in underground fertility. If we are to speed the departing tenant, we must not forget to welcome the tenant who is coming; and this welcome will not be enhanced if he is called upon to pay a large sum for ingredients which may not be available for many years, or even may not be in the soil at all. Land cannot be in high condition without this condition being visible, both in the crops and in the amount of dung accumulated in the yards. These are the proper subject for valuation; they have a market value, and do not necessarily impose a charge on the incoming tenant, as they can be sold on the market should the incoming tenant decline to pay the valuation placed upon them."

"London Times."

CARP CULTURE.

BY AMOS EBERT, KIRKWOOD, CAMDEN COUNTY.

Much attention has been given to the improvement of the breeds of our domestic animals, and we have called science to our aid, to render the soil more productive, so that we may increase the animal food supply. Notwithstanding all these efforts, and the immense grazing plains of the country, the price of animal food was higher the past year than it has been for several years.

If only a small portion of the time and expense were devoted to fish breeding and raising, which is now expended in the breeding and raising of other animals, the fish supply would be plenty and cheap. And fish can be raised in localities unsuitable and unprofitable for other productions. New Jersey contains thousands of acres now unsightly and unprofitable, which by little labor and expense might be made as profitable as any of the best cultivated parts of the farms.

It must be admitted that fish supply an article of diet, palatable, nutritious, easy of digestion, and in every way conducive to good health. The rural population consume too much salt pork, and other salt meat and fish, and the propriety of an occasional substitute for such food should not be questioned where mutton and beef can only be had at irregular intervals, and when eggs and chickens are not always available.

The propriety of fresh fish food being conceded, the question is asked, Is fish breeding and raising practicable—will it pay?

Fish culture has not been practiced very long in this country, but it is no novelty in many parts of the world. The breeding, preserving and fattening of fish as a branch of domestic economy has been practiced by various methods, by other nations from time immemorial. It has been carried on in China for ages. The Romans were adepts at it, and at one time a taste for fish raising became quite a passion

among them, and enormous sums have been expended by them upon the construction of their ponds and the feeding and preservation of their fish. During the middle ages, the kings and princes and nobles of Europe maintained their artificial "preserves," some of which were of enormous extent and supplied great numbers of fishes. A fish pond was an indispensable appendage of nearly every monastic establishment, and the priestly epicures were always well skilled in their management. At the present time, Europe contains artificial ponds of enormous extent, that of Princes Schwarzenburg, of Austria, covers an area of not less than 20,000 acres; there is one in Brandenburg, Germany, which covers 6,000 acres; and there are many of several hundred acres, and from that down to a few acres; and in some sections of Europe, nearly every large farm has its artificial fish pond.

Soon after the appointment of Prof. Spencer F. Baird as Commissioner of Fish and Fisheries, he called attention to the fish now generally cultivated in the private ponds of Europe, the carp (*Cyprinus carpio*), of the family *Cyprinidæ*; and Dr. Hessel, a German expert, was engaged to assist in their importation and care of them in this country; and, in 1876, an attempt was made to import some of these fish, but they all perished before they could be placed in a pond here; in May, 1877, they succeeded in importing from Germany, 345, which were placed in Druid Hill Park, Baltimore, and in the spring of 1878, 180 were found alive, and of this number, 113 were taken to Washington, and the same year these spawned, but hybridized with some gold fish which were accidentally left in the pond, and they were, therefore, all destroyed. In 1879, 6,000 young carp were secured, and these, I believe, were the first pure stock distributed in the United States.

The carp was originally imported into Europe from Central Asia several centuries ago, and is now cultivated nearly over all Europe, and is common in nearly all their rivers and lakes, and furnishes the principal fish supply in their markets, and brings the highest price, even higher than the rock and the trout.

The German carp, on account of its hardiness, rapid growth, prolific increase in numbers, its excellent table qualities, its abilities to feed itself in suitable water, is preëminently entitled to be placed first in the list of fishes for culture.

When reports were received of fish scarcely two inches in length,

and weighing less than an ounce in the spring of the year, increasing to measure seventeen to eighteen inches in length, and weigh from four to five pounds in about six months, it seemed incredible. But "seeing is believing." In April, we stocked a pond with small carp not over two inches in length, and in October we found them to measure over seventeen inches in length and weighed over four pounds. The water in this pond was supplied by a small spring ditch, and were not fed the whole season.

From my own experience, and from what I saw and heard of in other localities, I feel so encouraged that I am now constructing several ponds on a larger stream, which will cover several acres.

Much as carp culture may be valued as a branch of industry in Europe, it has been demonstrated that the waters of this country are much richer in fish food than European waters, as they seem to increase in size much faster here than in Europe. I have tried to read all that has been written on carp culture in our language, as well as translations from the German and French; also, many reports in the German language, and, from all I can learn, the average weight in European ponds the second year is about one and one-quarter pounds, and in more favorable ponds in the southern parts of Europe they may attain a weight of two pounds; and in the third year they will weigh about three and one-quarter pounds, while in our pond we had them to weigh over four pounds the second year. And in the last Agricultural Report by the Commissioner of the State of Georgia, we learn that they had them there to weigh fifteen pounds the third year!

The carp (*Cyprinus carpio*) are now divided into three groups, but no doubt they all originated from the same type; by cultivation through several centuries their condition became somewhat modified.

The scale carp (*Cyprinus carpio communis*) has regularly arranged scales, and likely resembles the original type.

The mirror carp (speigel), *Cyprinus carpio specularis*, has large scales in irregular rows along the sides of the body, the other parts of the body being bare.

The leather carp (*Cyprinus carpio coriaceus, sive nudus*), some of which have a few scales along the back and around the fins, and some have no scales at all.

Carp raisers generally recommend keeping these three groups separate, but they seem now quite mixed. I believe it is the opinion of

Prof. Spencer F. Baird, the United States Commissioner of Fish and Fisheries, that both the scale and the mirror are developing into the leather variety.

The habits of the carp and the trout are entirely different; the trout thrives best in running streams, with stony or gravelly bottom, of a temperature under fifty degrees Fahrenheit, and are carnivorous. The carp prefers quiet waters, muddy bottom, and will grow very little or not at all at a temperature of fifty degrees Fahrenheit, but thrive best in quite warm ponds; in fact, it cannot be too warm for them in the sunniest ponds in our latitude; and its food is principally vegetable, but will also eat worms and the larvæ of aquatic insects and vegetable algæ produced in stagnant waters during warm weather.

As a general thing, they need not be fed in suitable ponds and localities, except during the spawning season, to prevent them from eating their eggs. They are not very dainty and are easily satisfied, and will eat vegetable food, kitchen offal, &c.; in fact, most anything that pigs or chickens will eat, but it is best not to crowd them too much in the pond, then they will not require to be fed.

The carp grows only in warm weather, and twice as fast in June and July as it does in May and August, and very little in April and September; and in cold weather they hibernate in a cavity in the mud called a "kettle;" in this they huddle themselves together and remain in a kind of sleep until spring. While in this state they will scarcely move a fin nor lift their gills for breathing, and will not take a particle of food, and should not be disturbed.

The carp may reach a very advanced age; some have been known to have lived for more than a hundred years; and they attain to a very great size; some have been captured in European waters to weigh seventy to ninety pounds.

All the European authorities say that the carp will not spawn before they are three years old; but we have well authenticated cases that they have spawned in this country when only two years old. This difference may arise from the fact that they grow more rapidly in this country than they have ever been known to have grown in Europe, as before stated, and, consequently, they will mature earlier here.

Their spawning season is from May to August, and their fecundity is as remarkable as their rapid growth. A carp, weighing from four to five pounds, will contain from 400,000 to 500,000 eggs; and it is

said that over 700,000 eggs have been taken from the ovaries of a single carp of moderate size. It cannot be expected that all would hatch and live; but if only one in a hundred survives, there would be enough to stock a pond of moderate size.

The first and most important, as well as the most expensive part to be considered in carp culture, is the pond; in the construction of a carp pond, several things must be taken into consideration, and definite directions cannot be given, as it depends upon conditions which vary in different localities. In some localities very little labor is required, while in other places much labor and expense is necessary to make them safe and durable.

The things necessary in the construction of carp ponds to insure success are: A sufficient supply of water; keeping the water under control, and prevent overflow by freshets, during sudden showers, and have the fish escape by dam breaking and disappointing all your expectations; keeping all other fish, snappers, muskrats and other enemies out of the pond. It is an indispensable condition for successful carp culture, that the ponds be so constructed that they can be thoroughly drained, so that the fish can be taken out without any difficulty, and all enemies of the fish destroyed. It should not be more than from one to two feet deep over most part of it, except towards the outlet, where it may be five or six feet in depth.

If the water is too deep it will be too cold, and will not produce those innumerable microscopical beings which form the food of larger animals, which form the food of the fish; and if the water is too cold it will not produce those microscopical algæ, which also form part of the food of the fish. Every well-constructed pond should have a "collector." This is nothing but a place from twenty to thirty feet square near the outlet, where it should be deeper than any other part of the pond, for the fish to collect when the pond is being drained. It would be best if the collector had a wooden floor, and the mud should be cleaned from it when the pond is being drained.

Where the stream of water is of considerable size, and where much surface water collects, the inflow of the water into the pond should not be direct, and only the desired amount allowed to enter, and the remainder and that during freshets should be conveyed along the side of the pond; this would prevent the inflow of mud, rubbish and other fishes.

The inlet, as well as the outlet, should be of strong and substantial

construction, and should be well provided with gratings to prevent the escape of the fish at the outlet, and prevent other fish from entering at the inlet. All other fishes should be strictly excluded. The carp being of the *Cyprinidae* family, which includes the chub, *Cyprinus cephalus*, the gold fish, *Cyprinus auratus*, and several other varieties; if any of these were admitted the result would be hybrids, and would be worthless. And if you would admit the pike or trout, these being carnivorous, would destroy the carp.

Every pond should also be provided with a side outlet to prevent the rise of the water during continuous rainy weather or sudden showers, so that an overflow and washout may not be possible.

Judging from the progress already made in carp culture in the few years since it was introduced in this country, and the interest now manifested in the subject, it will, in the near future, be as generally practiced as it is in Europe; they have the start of us by several centuries, and have the advantage of us by that length of experience. They have oak trees two or three centuries old growing on the embankments which form their dams; and some of their dams are fifty to sixty feet high, and thousand of acres in water extent. One proprietor has a series of 250 ponds, the smallest of which is ten acres and the largest 2,000 acres in extent.

Carp culture is quite a new industry with us; we must be careful in starting; we must adopt correct methods; we can only expect to be successful in carp culture by observing the necessary conditions for their increase and development. If we do not start correctly we may be disappointed and end in failure, and then carp culture will be pronounced a failure; but if we commence correctly it will no doubt prove a success, and then it will not be long before nearly every farmer will have his carp ponds as well as his pig pens or his chicken coops.

Carp may be raised by what is called "mixed" culture—all in one pond. If such a system is adopted, they must have all the conditions necessary for spawning, breeding, etc. It must have a shallow, sunny place, filled with aquatic plants, a collector, and so constructed that the water can all be drained. Such a system has nothing to recommend it; in Europe it is called a "peasant pond," but it may be better than none at all, where there is no room for more.

The best method for carp culture is, no doubt, that which is called class ponds—where the spawners, breeding and the maturing are in

separate ponds. According to this system three ponds, at least, are necessary: a hatching pond, a breeding pond and a culture, or what I would call, a maturing pond.

The hatching pond, of course, is intended for spawning, hatching and a nursery for the young fish during the first season. Artificial impregnation is now very seldom practiced in carp culture, and natural impregnation is now almost altogether practiced by placing the spawners and milters in the hatching pond. Spawning takes place in May or June, and sometimes in July and August. A certain number of spawners and milters are calculated to an acre, but no definite number can be relied upon. It will not do to count chickens before the eggs are hatched; neither is it safe to count young fish before their eggs are hatched. It is safest to get all the young fish you can, as it is no trouble to get rid of a surplus, if there be any, either by selling them or placing them in natural waters. No more than 4,000 or 5,000 should be allowed to an acre in the hatching pond. It should be provided with a shallow and sunny spot, well filled with aquatic plants, the common pond lily (*Nymphaea odorata*), water grass (*Festuga fluitans*), or water cress (*Cruciferae*). The eggs are adhesive, and adhere in lumps to the object upon which they have fallen, and if any should not cling to some object and fall in the mud, they will be lost. If the water is warm the eggs will hatch in five or six days. The young fry should remain in the hatching pond until the following spring, when they should be transferred to a larger, or what is called the breeding pond. This pond should not contain more than about 1,000 to an acre. All European authorities agree in placing the weight of the fish the ensuing autumn, their second year, at one and one-quarter to two pounds; but we have them, during the same time, to weigh over four pounds, and fit for the table or market; but if we cannot raise them large enough for the table or market the second year, we will transfer them to a still larger pond, the culture or real carp pond, and by the ensuing autumn we will have something to excite the salivary glands of an epicure. No more than 400 or 500 per acre should be placed in this pond, and by the ensuing autumn, according to European standard, they would weigh from 2,000 to 2,500 pounds per acre; but we have far surpassed this estimate in this country.

The profitableness of carp culture may now be estimated when it is remembered that wherever the carp is best known it will find the

readiest sale at the highest price; and when it is also remembered that the ponds are generally located where the land is worthless for other productions, and that we need not expend any money for feeding them, nor for fertilizers to enrich the land, and that they need very little attention when the ponds are properly constructed, which need not necessarily be very expensive.

We have a department of our government of fish and fisheries supported by a small appropriation by our national government; at the head of this department is a gentleman of rare abilities, Prof. Spencer F. Baird, of the Smithsonian Institute, and many thousands of young fish have been distributed free of charge since the commission commenced its work. At the close of the past year about 15,000 ponds have been stocked, and about 10,000 applications were on file from different sections of the country, and new applications are received at the rate of from fifty to one hundred a day. The business has now attained to such proportions that it is impossible for the national department to respond to all the calls made upon it from over the whole nation.

Every State should have a fish commissioner who could be called upon for aid in the selection of the best sites for ponds, give advice in their construction, and give such advice and information that may be needed in this new and interesting and promising industry. There are appropriations made for other purposes not half so important as this. There is something pleasurable in fishing to nearly all mankind, from the humblest citizen to the president; and some persons will travel several hundred miles to hook a few trout or salmon; but I think it is more pleasurable to have a well-constructed and well-stocked pond near home, which can be drained at will, until their broad fat backs are exposed above the water, and then take them with the hands.

Nothing on the farm here at home has given so much pleasure as the ponds and the beautiful fish they contain. And then, as before stated, the pond should contain aquatic plants; this then gives an opportunity to cultivate those beautiful varieties now so much neglected in this country. We can cultivate the white and sweet-scented pond lilies, *Nymphaea odorata*, and the beautiful American lotus, *Nelumbium luteum*, which are indigenous to this State; these are rather difficult to grow after they are removed from their native ponds, but it can be done, as we have them growing in our pond. The

Egyptian lotus, *Nelumbium speciosum*, of which we have read so much, can also be cultivated here. Even the magnificent *Victoria regia*, the largest of all the water lilies, is now also grown in open waters in this State. That which beautifies our homes, and makes them more attractive to us and our children, certainly should be encouraged. It is pleasant to while away a few moments at the noon-day hour on the sylvan banks of a flowery pond, or, in the evening hour, see the silvery moon and the beaming stars mirrored on its glassy surface.

Fish ponds can be made to afford a variety of amusements, and can be utilized for various purposes aside from the main object and more practical use for which they are constructed. On such a pond, in winter, our boys and girls can have physical exercise, or work off an excess of youthful vitality by the exhilarating exercise of skating. In summer it can be used for boating, bathing and fishing, and in winter a crop of ice can also be harvested.

All these things tend to raise in importance and usefulness, and beautify the *home*, which should be the owner's dearest and sweetest spot on earth.

For some of the above I am indebted to Prof. S. F. Baird, Dr. Hessel, D. B. Long, Herr Rittergutsbesitzer, Eckardt Lübbinchen, Bericht über Karpfenvermehrung.

STRAWBERRIES AND THEIR CULTURE.

BY E. C. BELL, CAMDEN COUNTY, NEW JERSEY.

A writer under this head some years ago, put the question, "Why do not the millions of our population have and enjoy so simple, so delicious and so health-giving a luxury as the strawberry?"

Happily for those who consume the products of the fertile acres now devoted to this choicest of fruits, and for those who are reaping an honest livelihood in their cultivation, this question has been answered since then, by a rapidly increasing demand.

The strawberry has been classified by botanists as one of the large families of the *Rosacea*, of which, indeed, it is a very marked member, combining, as it does, very many distinguishing traits of the rose family. Linnæus described but two species of this genus, which he named *Fragaria*, as is supposed from the delicious fragrance of the fruit. According to Asa Gray, our own distinguished botanist, we have two species in North America, the *Fragaria vesca* and the *Fragaria Virginiana*, our wild strawberries from which have been derived very many fine seedlings; but in Europe, Asia and South America, and perhaps also Africa, other species have been found, some of which have been cultivated, and improved varieties have been obtained from them.

The naturalist who described the strawberry not being so much interested in the fruit as the cultivator, overlooked a peculiarity of this plant which has caused a great deal of discussion in horticultural circles. This consists in a departure from the regular or perfect character of the flower, observed in most species of the natural order to which this plant belongs. In them the stamens and pistils are perfectly developed in every flower, but this is rarely true of the strawberry, though, to a casual observer, many of the varieties would appear to have perfect flowers.

A careful observation will show that a large proportion of such flowers will not produce fruit of full size, and perfect form, and that generally only a very small proportion of the flowers will be followed by large, handsome fruit, while a great many of the blooms will wither and dry up, without producing the desired berry.

Further observation of strawberry flowers will very soon disclose the fact, that some plants produce blossoms in which the stamen does not make its appearance at all, being indimentary and concealed. These constitute what are called the pistillates, for though they have no perfect stamens of their own, they are easily fertilized by other stamen-bearing plants even at a considerable distance from them, the pollen being conveyed by insects or wafted by the wind.

The strawberry is the earliest of our small fruits, one of the easiest of cultivation, enjoyed by nearly all palates, a sure producer, and healthful for all. We doubt whether any fruit large or small will bear a character as this.

“What is the best soil for the strawberry?” This is the question often propounded by amateur cultivators, and while certain kinds of soil suit it best under cultivation, the plant in its wild state is found growing in nearly all situations.

Sometimes found almost upon the bare rocks, insinuating their fibrous roots into minute crevices among the debris of minerals and vegetables there accumulated in the lapse of ages; others on the sand hills that have been the sport of winds and waves until clothed with protecting vegetation. Then again we find some growing upon hard or arid gravel ridges, while others are found luxuriating upon loams and clays, and some upon the peaty and light moulds of the prairies, or even in the wet and spongy soils of our marshes. With these facts in view, it may naturally be concluded, the strawberry can be grown on all soils, and such appears to be the case, but here we find a great difference in results, the most successful being obtained from soils that contain a proportion of clay.

The remark was once made by an experienced grower in reply to such a question, that the ground which would raise good timothy was the place to plant them, and this general principle is substantiated by our own experience.

New land is often found a desirable place to cultivate strawberries and has the advantage of being clear of the seeds and roots of white clover and other weeds, and also because they seem to flourish in a

soil having a large proportion of leaf mould. Within the last decade, seedlings have been produced so numerously, all claiming to have superior qualities, that even the amateur is puzzled to keep their pace, yet it seems as if no one variety now introduced has attained perfection and there is still room for improvement. If the new comers were all equally as good, if not better, than their ancestors, which are continually depreciating, there would be little risk in extensive trial ; but this is not the case, the good and indifferent are sent out together, on the part of some through honest intentions, but we fear by others less scrupulous in the hopes of pecuniary gain.

The many varieties now cultivated differ greatly in their important characteristics, for, besides the differences in the blossoms, already mentioned, the color, flavor, firmness of flesh, strength of stiffness of the fruit stalks, density of foliage and uniformity of ripening are among the considerations claiming careful thought from all growers.

All these qualities scarcely ever exist in perfection in any one kind, so that the merits of each variety must be separately counted in order to judge of its excellence, and after a selection has been made, what does well in one locality often fails in another. Hence, any choice of varieties can never be made to suit all situations, and distance from market will also render useless some kinds that otherwise are very desirable. If we were asked to name five varieties as near No. 1 in general good qualities, we would mention, Crescent Seedling, Miner's Prolific, Sharpless, Mt. Vernon and Glendale.

These ripen about in the order named, and combine nearly all that can be asked for in our locality at the present time, which experience, however, may soon change, as some new rivals are proving good, and we would also encourage a trial of these by both the amateur and market grower. While it is essential for the best results that we should plant those kinds which have proved themselves adapted to our soil, very much depends upon the assistance of manures and thorough tillage. The cultivation of strawberries and the soil upon which they are grown varies in this part of the State as in others, greatly ; though more berries are perhaps grown for the Philadelphia market, on the plan of the bed system, than by any other method. Our course of growing them on this plan would be to plow deep in the fall, and, without harrowing, spread manure on during the winter, as the freezing and thawing allow the substance of the manure to penetrate the ground, while at the same time the action of frost is

useful in destroying insects which, in various ways, annoy the berry grower. As soon in the spring as the weather will admit it should be plowed or loosened thoroughly with a cultivator, and will then be ready for planting. The rows are marked out with a plow the desired distance apart—say four or five feet—and a little bone phosphate or ground fish dusted in them and covered with two small furrows, making a neat, straight ridge. The top of this ridge must be raked off so that when the plants are set they will be on a level with the general surface of the ground.

As soon as the plants are well started the blossoms should all be cut off to prevent the exhaustion of the roots, and it would be well also to remove a few of the first runners, in order to produce greater uniformity of growth in those that are to form the bed. After this, as the young plants take root, the cultivation is restricted to the width of the alley, being careful to go in the same direction at each working, that the harrow may not catch and break many of the vines. By this plan no effort is made to arrange the runners in the bed, but they are left to root as best they may. This is the method adopted by some nurserymen both for berries and for plants, and in favorable seasons the ground will be perfectly covered with a sod of fine plants. A great improvement over this way of treating them has been attained by keeping the runners loose till the first of the eighth month; by this means we are enabled to cultivate the ground by horse-power up to a much later period, thus saving a large amount of hand weeding during the summer.

Before setting any runners the soil on both sides of the row is thoroughly worked and raked smoothly, forming a slightly-raised bed; then selecting the strongest vines, place them a little distance apart—say five inches—and secure them there by weighting with small stones or clods of dirt. This is, no doubt, the easiest and surest way of obtaining a crop.

Very fine fruit may be grown in single rows two feet and a-half or three feet apart, the plants set a foot apart in the row; if well cultivated and the runners kept off the following spring, in good soil, they will form a continuous, bushy row, each plant having several crowns, and in some instances producing as much as a quart of berries. This is known as the narrow-row system, and is practically the same as hill culture, involving much less risk from loss of plants and saving much labor in the cultivation, also giving the fruit full benefit

of the sun and air, and enabling the pickers to gather the berries without breaking or mashing the foliage. Strawberries can be grown in this way if the planting be done either in the spring or fall, and will, we believe, be the method generally adopted, when it becomes better known by market gardeners and fruit growers.

At the present time there seems to be much diversity of opinion as to whether spring or fall is the best time for planting, and while we believe a large majority of growers are favorable to spring or late fall planting (to fruit the second spring), as plants set at these seasons of the year, are most certain to live, we have for a few years past adopted the late summer or early fall planting, which, if it were not for the great uncertainty of their living, even after watering, the results would be very satisfactory.

Some may think potted plants desirable, but as it requires, according to our mode, about 30,000 to the acre, this would be almost impossible, while for those purchasing small quantities, or where they are to be sent long distances, and especially if they are new and higher priced sorts, it will answer very well. We think the best mode of preparing the ground for fall planting, is to plow thoroughly, when the ground is not too dry, about the first of the seventh month; harrow and perhaps roll, then apply broadcast a liberal dressing of some good fertilizer or fine, well-rotted manure. Plow again shallow, harrow with a Thomas harrow, so as to have the ground as level and smooth as possible, when the beds may be marked and the planting be done, provided the ground be sufficiently moist, either from the effect of rain or artificial watering. These beds consist of four rows each, eleven inches apart, the plants twelve inches asunder in the row, and placed opposite each other, forming rectangular spaces eleven by twelve inches, and making beds thirty-three inches wide, with alleys of the same width. It is thought no advantage can be gained by having alleys less than the above width, nor in setting plants nearer together than ten or twelve inches, thereby giving the roots and foliage ample room, and also giving sufficient room for keeping the ground frequently hoed and clear of weeds; cutting off all runners and applying a dressing of bone phosphate before the second hoeing, will be found to be a material help. Whichever of the above described modes of culture is adopted, the crop will be very much increased, and by nearly all successful growers it is now considered indispensable, to cover the bed before winter with a mulch or top dressing of manure.

If manure is used, it should be well heated in order to destroy the germs of all seeds, partially rotted, and turned until fine. This may be applied as soon as convenient after a few heavy frosts, and before the ground is much frozen. While some may think salt hay will answer the same purpose, being cleaner and less expensive, not a few believe the percentage gained in fruit from the salts washed out of manure, and taken up by the plant roots, more than repays the extra cost of a good covering of manure; at the same time it will be found, after six months' exposure to the atmosphere and rains, to be nearly as clean as any other mulch. Early in the spring, after the ground has settled and is sufficiently dry, the alleys should be slightly cultivated and made level, when a mulch between the beds will be found to be very beneficial in keeping the fruit clean, and protecting the ground from the hot, drying rays of the sun. It is well known that the roots of a single plant penetrate the ground for a considerable distance, showing the necessity of pulling all weeds from the beds and alleys, that the fruit, instead of the weeds, may have the benefit of the moisture.

Though some may have been successful in growing fine berries, there is still much skill and care required to profitably market the crop. The berries should be carefully picked in new or clean boxes, mostly with short stems, so as not to break the glossy surface, and as often as convenient, so that none will be left until over-ripe. Where many pickers are employed this becomes very difficult, though none the less important, for any that may be left are sure to be too ripe by the next picking, and if mixed with good, fresh fruit depreciate the whole box. The sooner berries are picked after becoming fully colored, the longer they will keep.

The best kind of packages for shipping long distances are light, open baskets or boxes, which, being thin and pliable, are kept in position in the chest by the pressure of the lid, otherwise the continual jarring might produce sufficient motion to damage much of their contents. For short distances, however, the Bristol or Burlington pattern will be found more durable, equally good, and more convenient. Either style, when in slat chests, has ample ventilation, for, after becoming once dry and cool, a draught or change of air not only wilts the fruit, but turns it dark. Their keeping qualities depend upon several considerations. Most important, and also most beyond our control, is the weather, which must be taken into account when gathering this perishable fruit. If, immediately after a rain, when

the berries are impregnated with moisture, and consequently less firm, they should be picked in the heat of the day, they will soon spoil, a few hours sometimes developing mold, while, under more favorable conditions, the same berries would be salable from two to four days.

The plan of assorting the berries while picking has been adopted by some growers, the large ones being placed in one box and the smaller ones in another as the picker proceeds along the row. This, in some respects, answers very well, but it would be still more satisfactory if implicit confidence could be placed in the pickers themselves; such, however, not being the case, much disappointment may follow, for, should the culls, as sometimes happens, be topped off with good berries and in this way sent to market, the honest cultivator is liable to have his credit severely impaired.

WATERING.

The question of moisture is one that cannot be too seriously considered in the culture of strawberries. During the severe drought of 1880 the universal exclamation was, "all that strawberries want is plenty of water," and before the season was over many had tried watering in different ways—watering pots and other sprinkling apparatus, some even attempting irrigation. Most of the appliances were rude and imperfect, owing to the hurried thought and hope that with the returning day the token of the eternal bow might again be fulfilled and all their labor wasted. Yet it was not in vain, though, perhaps, of little avail, as by this means many new ideas were gathered, proving that it was possible and also practicable, even with a small supply, to increase the size of the fruit.

One of the main points is not to let the plant wilt or even show signs of death before the remedy is applied, which is too often the case. Neither is it necessary to have a saturated soil, the fruit being no larger or better than when grown on only moist ground, in fact in some respects it is greatly inferior. By this we do not mean to decri irrigation, but to say that so much water is not needed. From observation of a small field in Pennsylvania watered in this way, by means of a steam engine and pump, forcing eighty gallons per minute up a rise of fifteen feet in a distance of one hundred yards, where it was allowed to flow down three alleys, or over a breadth of sixteen

and one-half feet, it was found to reach the lower end of the plot in a little less than three hours time. Judging from this, unless water is very convenient and abundant, on our more porous soil with gentler slopes a less amount supplied oftener would be best.

If sprinkled from a fine hose in the form of rain drops, the greater part will be absorbed by the mulch or very dry surface dust; therefore, whether water carts be used or pipes run through the field and a hose attached, the water should be applied in sufficient quantity to form small puddles among the plants, when it will be found to penetrate down to the roots around the body of the plant, or settle away in the lowest part of the puddle, without wetting much of the hard surface. Twice going over the bed, allowing about one quart each time to the square foot, will be found to wet the under surface soil very considerably, and often proves of as much benefit as a light rain.

DAMAGE BY INSECTS.

While the strawberry plant is not exempt, but in common with nearly all cultivated crops, has its insect enemies, as yet, we have not seen or heard of any injuring either the plant or berry to any great extent. The white grub (or larvæ of the June beetle) is often troublesome in old sod land that has not been fallow for at least one year previous to planting; they feed upon the roots, which they cut off and eat bodily for an inch or two below the heart, when they attack another plant by coming to the surface or working their way through the ground guided by the small surface roots; at any rate they mostly destroy several adjoining plants. The grub varies in size, according to age, from one-fourth of an inch to an inch and a half in length, with brown head and rather dark abdomen; it is thought they remain in this stage about three years, hence, one reason why old beds become worthless. A small thin brownish worm, when full grown much resembling the meal worm, but when quite young are white or nearly so, living, according to some authorities, to an age of five years, known as the wire worm, pierces through the body of the plant, eating the innermost buds and woody tissues, but not killing it outright, as the runners or leaves will continue green, but it will make no new growth unless a sprout from below, as the roots are sound, and even this will be feeble. They are generally more numerous in peaty or low ground, where a heavy dressing of salt often has a beneficial effect upon the land, and kills many of the pests.

Another intruder, the crown borer, or worm, as it is sometimes called, is a very small white worm, scarcely as large around as a pin, and one-eighth to a quarter of an inch in length. The plants affected by these are most noticeable about the time of blooming, where, on examining, they are found as indicated by the name, in the crown or heart eating the buds, and in other ways, causing the plant to look dwarfish, with the foliage inclined to be irregular and also barren, though there are many non-bearing plants not affected by insects, particularly in some varieties, mostly staminate sorts, but why they are so remains a question.

The Cumberland Triumph has this fault to a very marked degree, which will, if not remedied, discard this valuable kind. One simple suggestion may be offered, that is to propagate only from those plants that have borne a crop of fruit; the narrow row culture offers a convenient plan. Might not all varieties be improved in this manner, choosing those hills that are finest in every respect?

The cut worm, well known to farmers by its appearance in the cornfield when replanting, may also be detected about this time in the berry patch, particularly in the heat of the day, by the wilting leaves and fruit stalks here and there, severed the previous night, and under which, or near by concealed from view, he lies and eats during the day. These rapacious-insects embrace several species differing principally in color and size, but are not accorded as doing much injury, although some seasons very numerous.

These include about all the insects most destructive to the plant and annoying to the grower.

Important service, however, in the destruction of these pests, is rendered the cultivator by Guinea fowls, which are highly useful as well as being quite as insectivorous as birds, daily traversing the fields in groups or pairs, turning every small sod or suspected clod in their search and leaving little doubt as to the great quantities they destroy. The fact of their thriving three parts of the year without attention, and, being little inclined to scratch, or peck either fruit or vegetable, overbalances their noisy chattering, to which so many object.

Though not of this order, a small, nevertheless useful, animal, the toad, needs protecting by even the flower-culturist, instead of the too-often cruelties of the thoughtless youth.

ESSAY ON POULTRY.

BY WALTER S. STOY, HADDONFIELD, N. J.

All birds are divided into six classes : the first four comprehend the various kinds of land birds ; the two last those that belong to the water. I will confine myself to the characteristics of the kind called "Poultry," and add suggestions which I have found profitable, and might be deemed worthy of notice by those who are exercised in the interests of poultry. From the most rapacious and noxious tribes of birds we make a transition to those which, of all others, are the most harmless and the most serviceable to man. He may force the rapacious tribes to assist his pleasures in the field, or induce the smaller warblers to delight him with their singing ; but it is from the "poultry kind" that he derives the most solid advantages, as they not only make a considerable addition to the necessaries of life, but furnish the greatest delicacies to every entertainment. Almost, if not all the domestic birds of the "poultry kind" which we maintain in our yard are of foreign extraction ; but there are others to be ranked in this class that are as yet in a state of nature, and perhaps only wait till they become sufficiently scarce to be taken under the care of man to multiply their propagation. All birds, we are told, taken under the protection of man lose a part of their natural figure, and are altered, not only in their habits, but their very form.

Climate, food and captivity are three very powerful agents in producing these alterations, and those birds that have longest felt their influence under human direction, are the most likely to have the greatest variety in their figure, plumage and disposition.

Birds of the "poultry kind" are described as having white flesh and, comparatively to their head and limbs, have bulky bodies. Their wings are short and concave, for which reason they are not able to fly far. They are furnished internally with a very strong stomach, com-

monly called a gizzard, so their voraciousness scarcely knows any bounds. None grow fat, except the "poultry kind," which seem to lose all remembrance of their former liberty, being satisfied with indolence and plenty.

A habit peculiar to this class of birds is that of dusting themselves. They lie flat on some dusty place, and with their wings and feet raise and scatter the dust over their whole body; what may be their reason for thus doing is not easy to explain; possibly the heat of their bodies is such that they require this powder to be interposed between their feathers to keep them from lying too closely together. There is a great diversity of opinion in regard to the management of poultry, as to the particular and desirable breeds, for the required purpose. First of all, proper care and keeping is essential to success, for a person may have the best known breeds, and if they are not properly cared for, they will in most all cases prove a failure. Therefore I wish to impress upon the mind of the breeder, in the outset, that this needs attention more than purity of breed or superiority of kind. Previous to one's starting out in the business, plans should be well matured and digested, in regard to the plan of the house, yard, and the number of fowls one expects to keep. Overcrowding and irregular feeding will prove detrimental. I have made the feeding one of my special studies, and have noticed that the process of digestion is a slow one. The meal is taken by picking up their food under ordinary, or what we may call the natural condition, grain by grain, and with the aggregate, no small amount of sand, pebbles and the like, all of which, passing into the crop, assist digestion greatly. The general mode of feeding is to throw the grain out to them in heaps, and the birds are allowed to eat with such rapidity that their crops are soon filled and the process of assimilation is slow, painful and incomplete. If a little precaution is taken in the simple matter of feeding, I will assure you there will be less ailments to contend with. More eggs can perhaps be obtained from hens by mixing breeds than by any other mode; and it is generally conceded that crossing also promotes the health of fowls far more than the vile practice, as some are pleased to term it "in and in breeding."

Little trouble need be apprehended from various diseases in poultry, if that care is also observed in breeding and crossing, which is so essential to all well regulated poultry yards.

One of the most important points to be observed in setting eggs

for hatching, is to correctly proportion the number, taking into consideration their size and the size of hen about to set upon them.

The state of the weather should also be a guide, for a hen capable of setting upon and hatching thirteen eggs in June ought not to have more than ten in January. The greatest error of setting a hen upon more eggs than she can cover, is a cause of very general disappointment.

Setting a game upon thirteen eggs, caused me to make a special study of this; also, it appeared perfectly clear to me that it would be impossible for them to receive a proper and equal share of heat from her body.

It is absolutely certain, also, that this hen could not hatch out chickens from those eggs which she could not draw close up to her body, and give to them the natural warmth they require in the process of incubation.

This was very clearly demonstrated to me when I ought not, at any season, to have given more than nine, or, at the most, ten; and when out at feeding time, I, at first glance, found only eleven eggs in the nest, I at first thought the hen might have eaten them; but after one or two examinations, I found that they were buried beneath the others. I replaced the eggs properly in the nest, and found that she regularly removed one or two of them; thus it was apparent that she had more eggs under her than the surface of her body could cover by contact. This marvelous fact proved the existence, first, of the beautiful principle we term "instinct," and the ardent natural desire for carrying out, to the fullest extent, the remarkable operation we understand as incubation. After the chick has entirely freed itself from the shell, it should not be disturbed for about twelve hours, then handled with the greatest care. This affords it the opportunity to receive the natural heat from the hen that is required to strengthen it before being exposed. In regard to the care, after being removed from the nest, must be governed by the seasons. If one intends to raise early birds, he must have the necessary accommodations; if not, his undertakings will prove a failure. Chickens hatched later do not require near as much attention, except in feeding and kept out of storms and heavy dews; these being the most important points in view, the breeder should exercise his own judgment, for I have found that the management in one climate would not suit in another.

Too many fanciers and farmers, otherwise earnest in their business, are very careless concerning their fowls. Interbreeding certainly

degenerates, particularly when so promiscuously permitted in a flock of fowls as in common. There are the same good reasons for making choice of the best breeds of fowls, as for making the same choice in other stocks. For, while a prime breed is as easily reared, fed and housed as a poorer one, there is a decided difference in the return in favor of the former.

If properly cared for, I do not hesitate to say that fowls of superior order do yield the farmer even the largest interest for the outlay he makes of any other stock he keeps.

THE POULTRY CROP ON NEW JERSEY FARMS.

BY B. R. BLACK, MULLICA HILL, N. J.

Exact figures are not at hand to show the extent of the poultry business in the State and its relative importance to other industries. Enough, however, is known to warrant the assertion that it is worth looking after by those who are striving to earn a living from the product of their farms. The writer is of the opinion that more attention should be given by farmers to poultry, and that the poultry crop in the State should be largely increased.

New Jersey farmers are favorably situated for the poultry business, in that they are near to New York and Philadelphia, two of the largest markets in the United States. These cities draw their supplies from all the surrounding States, and even from the far West. They are compelled to do so from the inadequacy of the supplies in the immediate vicinity. Any person examining the daily market reports will not fail to notice that poultry products from New Jersey always command the highest market prices. This is due to two facts. The first is, that New Jersey poultrymen have established a reputation for furnishing the very best quality of poultry products. The second fact is, that being near to market, New Jersey products are always regarded as fresh and in prime order. Poultry and eggs, like the vegetables of the market-gardener, rapidly deteriorate with age, so that those who are nearest to the consumer always have the advantage over their more distant competitors. New Jersey farmers, therefore, have access to two of the largest and best markets, the demands of which are practically unlimited.

It is safe to say that no farmers in any State are more favorably situated than we are for poultry raising, so far as soil and climate are concerned. In the Eastern and Northern States, the long, cold winters and heavy snow-falls make the winter care of poultry both

laborious and expensive. In the South, the extreme heat gives rise to epidemics, and makes vermin an almost intolerable nuisance to the poultry-keeper. Our climate, reaching to neither extreme of heat and cold, is more favorable. The soil, too, in the greater portion of the State, is porous, easily drained, and contains gravel and other elements favorable to the rearing of thrifty fowl stock.

Aside from these favorable conditions, peculiar to our State, there are general reasons why prominence should be given to the poultry crop. It is estimated, and we believe correctly, that a pound of chicken can be raised for less than it costs to grow a pound of pork. As is well known, the price of the former is always higher, often double or triple the price of the latter.

The Western farmer, with his cheap corn, can raise hogs and deliver them to our markets at a price that will not pay the New Jersey farmer for the feed consumed. He virtually has a monopoly of this business, and should be left to enjoy it, while the New Jersey farmer turns his attention chiefly to that branch of stock-raising in which his Western neighbor cannot compete, except at a disadvantage. Such a course would be beneficial both to the health and the pockets of the farmer and his family.

Domestic fowls are natural scavengers, and will utilize much that would, in their absence, be wasted. On dairy farms, and on those devoted to mixed farming, there will always be much offal that will help to support a flock of poultry, so that their keep will scarcely be felt by the owner. On the premises of market-gardeners, too, where it is not practicable to keep larger animals, fowls may be kept in yards and supplied with waste vegetable matter, the cost of the grain required in addition being comparatively slight.

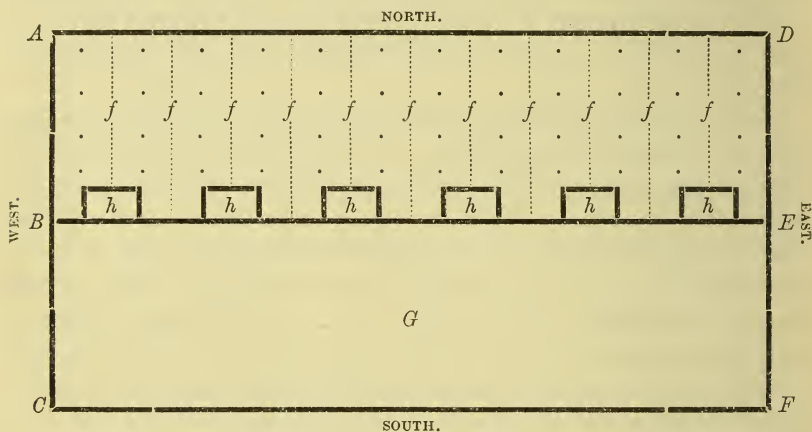
Much labor now unproductive might be utilized in poultry breeding, to the great advantage both of the individual and the State. The labor connected with it is comparatively light, and therefore adapted to such as are physically weak and unfitted for heavier toil. By giving the young folks the care and profits of the poultry, they may be trained to habits of industry, in business methods, and to self-dependence. The old folks, ladies who seek out-door exercise, and partial invalids, may find in the care of poultry pleasant and profitable employment.

If the query be raised, "How shall the poultry crop be increased?" we would answer with the following practical suggestions:

In the first place, let farmers provide suitable buildings for their poultry. It is needless to say that this is not done by the average New Jersey farmer. To meet the requirements of the farmer such buildings must be cheap. Mr. A. C. Hawkins, of Massachusetts, the largest poultry breeder in the United States, has houses constructed on a plan as well adapted to the farmer, as to his own purposes. They are long, comparatively low, affording ample space on the ground, are supplied with abundance of light and ventilation, and are divided into separate apartments for small flocks. In some cases, a number of small houses on different parts of the farm may be preferable. But, in any case, the building must be storm proof and capable of being kept dry in the interior; in no case need they be expensive.

Not only are suitable houses required, but also suitable runs or yards. It is a well-established fact, that two flocks of fowls of fifty each, will yield a larger profit per head than one hundred fowls in a single flock. The larger the flock, the less profit per head and the greater the liability to disease. If, therefore, the poultry crop is to be increased it must be *by increasing the number of the flocks*, rather than by enlarging a single flock. This involves the building of additional houses and fences, and an outlay of cash which few farmers can afford, unless they have a prospect of receiving returns from other sources than the poultry for the expense incurred and the land occupied. To obviate the difficulty and meet the requirements of the case, we suggest that a generous portion of the farm, say one, two, three, or ten acres, according to the size of the farm, be devoted to vegetables and fruit, and that this space be also occupied by the poultry. The plot should be in rectangular form, and be enclosed by a good, permanent, picket fence. A series of small double houses, or one long house, as mentioned previously, should be located on a line drawn through the center lengthwise. Movable fences of light pickets are to be made running from the house or houses to the side fence, dividing the ground on one side of the buildings into runs capable of supporting a flock of from thirty to fifty fowls. Corresponding divisions must, of course, be made in the interior of the houses. Whenever practicable, the plot should be so laid out that the houses may front the south. The southern half is to be used in summer as a vegetable garden and in the fall and winter for the poultry. As soon as the ground is cleared of vegetables in autumn, it should be sowed

with rye to supply late fall and early spring pasturage for the poultry. The northern half we would plant with fruit trees, such as plums, peaches, early cherries, and if the plot is large enough, a few apples. We would also have one good mulberry tree in each fowl yard, and grape vines along the outside fences. We would have the yards of ample size, so as to admit of working with horse and plow, and the trees so far apart that they will not shade the ground so densely as to prevent the growth of clover, rye and vegetables between them. This northern half is to be used as the summer quarters for the poultry.



A diagram illustrating plan of combined fruit orchard, vegetable garden and poultry yard, proposed in essay.

A, B, C, D, E, F, Permanent fences.

f, f, f, f, &c., Movable fences, dividing the orchard into yards in summer, and the vegetable garden in winter.

h, h, h, h, &c , Double houses, each apartment sheltering thirty or forty fowls.

G, Vegetable garden.

The plan we have suggested may be modified by planting the whole plot with fruit, so as to have only two or three trees in each yard, and using one-half of the plot for vegetables one year, and the other half the next. By this means a rotation of crops is secured, and the soil becomes thoroughly worked over and purified each season.

The common practice of allowing fowls to have free range of the premises at all times is only to be tolerated on large grazing farms, or where land is plenty and cheap, or where the flock of poultry is very small. We would, however, advise, even when special quarters

are set apart for the poultry, that a flock composed of carefully selected specimens for breeding purposes be allowed free range, and that suitable accommodations be provided for them near the cattle yards and stables.

It is very important, in keeping fowls in large numbers and in limited runs, that close attention be given to feeding them with a variety of suitable food. The farmer spends the whole summer season in growing crops for the use of his horses, cattle and hogs. He carefully stores and prepares these crops for the animals; he studies the wants of his stock and feeds accordingly. But the average farmer makes no provision for the fowls, and does not consider that it pays to feed them anything but a little corn. There are facts to warrant the assertion, that very few farmers know anything about the feeding and management of poultry. And we believe, until they give the matter the same consideration and study that they give to the other live-stock on the farm, they will not succeed in making poultry-keeping pay.

In closing, the essayist would suggest to farmers that more attention be given to caponizing fowls. Birds thus treated are more easily managed and fatten more readily, and bring much higher prices than those not so treated.

Also, that more care be exercised in preparing the poultry crop for market—that is to say, that all poultry be well fattened, and dressed and shipped in the best possible manner. Improvement may also be made in the manner of packing and shipping eggs. Consumers will usually pay much more for strictly fresh eggs than for those of doubtful age and quality. Heretofore, farmers not in the immediate vicinity of the cities have not been in a position to obtain retail prices, chiefly from a lack of a handy package for shipping eggs. This want, we have reason to know, will soon be supplied.

To the cry that poultry-raising is overdone and will not pay, we reply that more than \$100,000 worth of poultry and eggs were imported from Canada in the year 1882, and that poultry and eggs are still so high in price as to be regarded as a luxury, even by farmers themselves.

POTATO CULTURE.

BY VAN BUREN GRIFFIN, KIRKWOOD, N. J.

Our potato received its name from Gerard, who grew it in his garden about 285 years ago, and from its resemblance to the sweet potato.

It consists of a root to take up water, leaf to deposit solid matter, and a stem with tuber, to supply nutrition.

It comes to us through the ages just past in the form of a great variety of seedlings. It has been fraught with disease, more destructive, probably, than any other vegetable of so much value to mankind. We have reason to assert that here, where it was cradled in its infancy, it has been neglected in its unfolding blessings to our people—that it has been left to another nation—another people to grant it that experimental and fostering care that in part gives it to us as we find it. Therefore we farmers should carefully see to it that the potato interest is not neglected. We, in our county, have this fact to face, that we cannot raise large crops of potatoes with so little care—with so little expense—all things considered, as in former years.

If the crop deteriorates so rapidly for the next thirty years as it has for the past, (by the report of the corresponding secretary of our county, I see we only raised sixty per cent. of a crop, the season being quite favorable,) we will have to look elsewhere for our potatoes. The continual growth of this crop by rotation for years has, no doubt, brought about this exhaustion. It is our belief that we use too much marl and common manure, to the exclusion of wood-ashes, phosphates and lime. That is, the same amount expended in these articles would bring about better crops of potatoes. Potato tops are rich in lime and magnesia, and poor in potash; but tubers are rich in potash. Any element that enhances the growth of the plant wards off any fungus disease, and renders its share in producing a larger and better keeping crop.

Wherever the soil furnishes, in sufficient quantity and proper working proportions, the elements required for the structural developments and active working of the plant, obtains thereby a power sufficient to throw off all disease, and give to us a large healthy crop. It would appear our land no longer contains in proper form and quantity those constituents necessary to the healthy growth and perfection of the potato. It must be remembered the potato returns little to the land, and by getting the first use of the manure, takes more out of the soil than is easily replaced.

The ingredients of our potato are water, starch and albumen; of the plant fibrin, albumen and starch. To have in the soil those elements necessary to the proper growth of the plant so as to bring it to quick maturity, is what we desire. If by close observation we can thoroughly understand the wants of our soil, it will be easy for us to select in the manure best fitted to increase our produce, in the direction we consider to our best advantage.

It is necessary to be very careful in the selection of seed. I have known farmers to lose almost their entire crop by mistakes made in the purchase of seed. This is partly caused by the great variety of seedlings of inferior quality becoming mixed with different varieties. Our largest growers select their seed from different localities of a higher latitude.

A seedling will degenerate in about twenty years, unless carefully nurtured. In Camden county we should not raise less than two hundred bushels per acre to make it a successful crop, yet few do it. There is no crop we raise to which is attached so much expense as the potato. There is no vegetable of so common use on the table of the rich, and more particularly the poorer class, containing, as it does, those essential elements necessary to recuperate the exhausted wants of man.

We get the best results by rotating after corn. By composting our manure, mixed with marl, plaster and fine ground bone, we should use more potash. Thus we have elements that are not exhausted so readily, but remain to enrich the coming crops. Our soil is a heavy, sandy loam, and thus retains elements received longer than a porous soil.

We plant in drills nearly three feet apart and fourteen inches in drill. Have learned by experience that the seedlings raised in our latitude, in this day, should be planted very shallow, early in season,

forced rapidly and early marketed. We have been partly forced to this practice by the sad havoc for years of the potato beetle. We think, now, we can see the light beyond the silver lining, and like many other pests to the farmer that have been forgotten, it, too, will soon only be read of in history.

The past few years, no crop has paid better, for high manuring, than potatoes. It is possible, with everything favorable, to get much larger crops than are usually grown, and the difference produced is greater from such a method than is produced in the raising of wheat, corn or hay.

This, together with the fact that it is a preparation for the crops mentioned, causes farmers with us to save nearly all their stable manure for fields intended for potatoes. This brings us to the fact that, as potatoes return very little to the land for what they exhaust, consequently, if those ingredients are not in some other way returned the land is left in a less fit condition to produce, as the subsequent rotation returns, as good a crop as previously, and this may lead us, in a measure, to the cause of a noted decrease in our production; also a continual decrease in quality and more liability to disease. From our observation, and what we have been taught, in land such as ours, containing an ordinary amount of nitrogen, ammonia may be excluded as a manure for potatoes without injury to the crop. In soils rich in potash, the addition of phosphates is essential. In soils poor in potash, but containing a sufficient quantity of phosphoric acid, the addition of wood-ashes is essential to an increased yield of potatoes. We should plant a good sized, plump potato with deep eye.

Edmund Hersey, who is experimenting on this subject, and expects to keep it up for years, in the *Massachusetts Ploughman* of October 21st, 1882, gives his results and reasons thus far decidedly in favor of small seed.

I notice, by experiments made for six successive years by J. W. Sanborne with whole potatoes, small ones and cuttings, has resulted, in a large degree, in favor of prolific tops for whole potatoes; then a continual degeneracy as you depart to cutting and small potatoes. Yet it appears, leaving out all the whole, thus far, decidedly in favor of small seed.

The British nation, years ago, thought they had made a discovery in the production of new varieties by cutting all eyes out of one

variety and placing the bud or eye of another variety in its place, but this, after much experimenting, has proved a failure. It is said they cut their seed weeks ahead of planting, and if they do not stand a test of two weeks, are not fit to plant. We might say, here, to the shame of our nation, that England, who adopted it so quickly, has done ten-fold more in the way of expenditures for its experimental advancement than our own nation.

These experiments with small potatoes are entirely contrary to what we have been practicing and observing. We invariably feed our small potatoes, use cuttings for planting, cutting from stem and leaving one eye, cut from center around the potato and split the blossom end. We believe, if time permitted, to cut all eyes but one out of the blossom end would be better. We are at a loss to know why, often, without any known cause, our entire fields are so much worm-eaten, injuring the sale to a very great extent. It cannot be said that marl, too much manure, too little manure, too much guano, or inferior seed has been the cause, for we have experimented with each and find all to fail at times. Again, we have observed in planting, at times, the fore part of the day's work would come up well, and the after part be more than half missing; this on soil exactly alike, and no difference in seed or manure.

We trust these experiments will be continued. New departures are as essential in farming as other occupations. We trust to hail the day when those who represent the nation in high places will see to it, that this industry, as well as all others connected with farming—the foundation of all prosperity to the land—will receive its proper rank and place among the industries of the people.

It would be well for those whom we send to make our laws, to have the following sentences, composed by some one, written on the tablets of their memory: The money made by farming is the cleanest, best money in the world. It is made in accordance with God's first law, under honest and genial influences, away from the taint of trade or the fierce heat of speculation. It fills the pocket of the farmer at the expense of no other man. His gain is no man's loss; but the more he makes, the better for the world at large.

Prosperous farmers make a prosperous people. Whatever benefits our agriculture benefits the commonwealth.

FERTILIZERS.

VINELAND, February 9th, 1883.

P. T. Quinn, Secretary State Board of Agriculture:

I am very much disappointed that I could not have attended the sessions of the State Board of Agriculture. I wished to have heard the talk on fertilizers, as I am very much interested in them. If I had been there, and there was time, there is one point that I would have tried to impress on the minds of the farmers, and that is, to experiment for themselves on their own land, to find out what their crops need for fertilizers. If a farmer is short of manure and has to buy commercial fertilizers, it is the best and most economical to find which of the three ingredients, nitrogen, phosphoric acid or potash, his crops need or his soil needs to produce certain crops. Six years ago I commenced a series of experiments on sweet potatoes. Home-made manure was short, and I had to go upon the market and buy commercial manures. Not getting as good results as I thought I ought to with the common superphosphates, I undertook to find out what my soil needed most for potatoes. On all parts of my farm I tried the experiment, and it told the same story. Potatoes needed potash—100 pounds of actual potash to the acre—and I found that it was the potash that the phosphates needed. Now, if I mix 200 pounds of muriate of potash with the phosphate that I intend to put on an acre, the results are very satisfactory. In fine ground bone there is twice the number of pounds of phosphoric acid that there is in common superphosphate, and they sell at about the same price per ton. Now, I find that with the same money value per acre, I can get as good results with the one as the other. Now, then, if the bone does as well as the other, does it not stand to reason that there would be more of the phosphoric acid left in the ground for future crops, in the shape of the coarser parts of the bone, than would be left from the superphosphate? I don't think the crop would take up any more in the one case than in the other. It used to be very hard

to get a catch of clover on this soil, but since I have been using so much bone I don't have near the trouble to get a catch. And that tells me that clover needs phosphoric acid and potash. On all my potato ground I use every year 200 pounds of muriate of potash, and from 200 to 400 pounds of bone to the acre. I mix the most of my bone with my manure, so that there will be about 200 pounds per acre, besides the manure, some eight or ten one-horse loads. It heats up and softens the bone, and makes a splendid fertilizer for sweets. If there is no manure, then use 400 pounds of bone and 100 or 200 pounds of fish guano; the plants needs a little nitrogen to start them. I have experimented on corn some, and that needs, on this same soil, nitrogen first, last and all the time; so, if I buy for corn, I get nitrate of soda, dried blood, fish guano, Peruvian guano, and so on. Do you begin to see why farmers should experiment for themselves? Then there is another thing that we have found out, and that is, we can get good corn on a clover sod, with just a handful of something in the hill to start it with. And now to boil down in a nut-shell. The clover will fetch corn, then run the land two years to potatoes, with a dressing each year of 200 pounds of potash and 200 to 400 pounds of bone, according to the manure, that will fetch potatoes; and then seed to clover, with twenty bushels of lime per acre, to act upon the bone and other ingredients left in the soil from the potato crops. In farming this way very little nitrogenous fertilizers need be bought; they are costly. And then, because some of these phosphates smell strong, you are not sure that you are getting your money's worth.

Excuse me for writing so much; I got interested myself.

Yours, truly,

A. P. ARNOLD.

SWEET POTATO CULTURE IN CUMBERLAND CO.

BY A. P. ARNOLD, OF VINELAND, N. J.

The best portions of Cumberland county for the growth of the sweet potato are along its creeks and rivers, and the sandier portions, what has been styled the "Barrens of South Jersey." It seems almost impossible to have the soil too sandy, as I succeeded in raising fine potatoes on a sandy knoll that would do to plaster with, and was at least six feet deep before the subsoil was reached. The crop, as far as I can learn, was very good; thousands of barrels having been shipped from this station. Some of the largest yields were Mr. D. C. Gerow, on quite a large patch, averaged over 300 bushels per acre. Mr. S. Sargent, from 700 hills, sixty-six bushels, or about 450 bushels per acre. The sprouts are raised in beds, to be heated by manure or fire; we use mostly beds made of tile, to be heated by fire, a description of which I gave in the *Philadelphia Press* and before the New Jersey State Horticultural Society last year. I am still in favor of these beds, but would recommend them to be shortened to forty feet in length, as there is some difficulty in getting the ends warm enough and not get the center too warm; my beds, now, are eighty feet in length, and I propose to use two fire-boxes instead of one as now in use. The fire-boxes to be put in on the side twenty feet from each end, giving forty feet of bed to be heated by each fire. The seed is generally put in the beds the first week in April; we endeavor to use the short, round Nansewood variety; they will sell better in market than the long cow-horn variety. A good, clean, bright yellow or golden color preferred, which, with our sandy soil and plenty of potash, will do the work.

I am still in favor of potash on all my land. I use at least 200 pounds per acre, to be spread on broadcast or in the drill, never in the hill. The most successful growers here practice a rotation of

crops; first, clover two years, corn one year, then sweet potatoes one or two years. One of my neighbors raised over 100 barrels to the acre on quite a large patch the past season on land that had been subject to this rotation for a number of years. He used a small shovelful of stable manure to the hill, the hills being two feet nine inches each way.

On such land with 200 pounds of muriate of potash in the row and a small shovelful of manure in the hill, seems as well suited for sweets as any that can be got. Most growers set these plants about two feet nine inches each way, though I prefer the drill best, three feet apart, the plants eighteen to twenty-seven inches in the row, according to the fertility of the soil.

Plants should be set by the middle of May, and keep the ground stirring, clean and mellow. The main object is to get them advanced so that they can be dug in September, and get a good yield per acre, as early potatoes always fetch a good price in market. Some growers set as early as the last of April, if the weather will permit. In the absence of plenty of stable manure we use a great deal of commercial fertilizers of the different kinds. I still prefer finely ground raw bone. Make all the manure possible on the farm, and mix fine bone with this at the rate of 200 or 300 pounds per acre, and use 200 pounds of potash in the drill or broadcast; don't put it in the hill or mix it with the manure. Where no barnyard manure can be had, would recommend fine bone, 400 pounds fish guano, 200 pounds muriate of potash, 200 pounds mixed, and applied in the drill. I still find this as good as anything that I can get. It is an open question as to its being best to store for winter or not. If the crop is forward enough to dig early, then is the best time to sell. If not, let the potatoes grow till the frost takes the vines, dig and store at once. I have generally stored in large bins, holding 200 to 400 bushels each, but must confess that I am getting sick of them, not that we can not keep them in them, but the pouring or dumping them out of baskets or trays, that mark, scab and bruise them up.

I like to see a potato clean, smooth and bright when shipped to market; such stock put up in nice, clean barrels will fetch twenty-five to fifty cents more per barrel than stock that is scabbed and bruised by too much handling. I am using trays that hold a bushel each; the potatoes are carefully sorted into these, and set away till wanted to be packed for market. No bruises or marks, and carefully

packed, they present an appearance that is inviting to the buyer. Some old growers may think this is too much work. I claim that it is less. Potatoes are a heavy, bulky crop, and the less they are handled and lifted around the better. These trays cost about ten cents each for material, and can be piled on top of each other, and are very compact. I have the best success by keeping the temperature about sixty-five degrees. At digging time, in the storing cellar, give plenty of air till they sweat off.

The diseases of the sweet potato originate mostly in the hot bed, I believe. With good success, there is not so much trouble in securing a crop. Three years ago I had rather poor luck with my bed in getting plants, and I had a great many die soon after setting the plants, turning a kind of yellow or reddish color, and gradually die away. That is called here the red rot. Those potatoes stored in the cellar contracted a kind of black scab and dry rot on the end. The season of 1881 I used the same seed, not finding any that I thought were any better, but had good luck with my bed; very few died at the setting, with no black scab or rotten ends in the winter to speak of. Used the same seed for the season of 1882. In using too heavy, sandy loam on my beds, I had rather bad luck again, although I had a fair crop, but many of the plants died at setting, and I can find plenty of the black scab and potatoes rotten on the end this winter in the bins; so it does seem that the beds do have something to do with it. But here is another question: Having several hundred of these trays that I spoke of, I put those potatoes in them that I thought the least likely to keep well, on account of being damp or wet. They were put in at all times and from all parts of the field, and yet I find but very few that have the black scab or rotten on the end. Can any one explain it to me? I have been particular in describing this disease, as it is the worst one that we have to contend with here in this section. One more question: Can any one tell me what is the feeding value of small sweet potatoes fed to hogs? As every grower must have plenty, he is anxious to know what to do with them. Will it pay better to sell at fifteen cents per bushel than to feed? We know that our horses, cows, hogs, in fact everything on the farm have a feast at digging time, and all through the winter, when small ones are as cheap as they are this season, what shall we do with them, sell or feed?

HOW PROTECTION AFFECTS THE FARMER.

An Address Delivered before the New Jersey State Agricultural Society, at Waverly, September 22d, 1882.

BY HON. THOMAS H. DUDLEY.

Agriculture was instituted as an industry by God when he proclaimed to Adam, "In the sweat of thy face shalt thou eat bread." The first record we have of its application is when the two brothers brought the products of their industry, one from the field, the other from the flock, as an offering to the Lord; the one was accepted, the other rejected, and the result was that Cain slew his brother Abel. From that day to the present, whether with indigo upon the plains of Hindoostan, teas in China, spices in Ceylon, coffee in South America, the sheep ranches in New Zealand, the cattle herds of the Boers in South Africa, the sugar in Jamaica, the rice fields in India, the cotton plantations in the Southern States, or the grain-growing prairies in the West, agriculture in some one or more of its branches has been and ever will continue to be the leading industry of the world.

If it is not the foundation upon which all the other industries rest, it may be said with truth to be the most important, for upon it all the others depend; indeed, no other industry could be successfully prosecuted, even if it could exist, without it. Mankind might dispense with wearing shoes, and use rawhide to wrap their feet, and if all were to agree to this we might, however inconvenient, dispense with the shoemaker; but it would be impossible for the shoemaker to live without the farmer to supply him with food.

The agricultural industry in the United States, one year with another, probably amounts in products to about five thousand millions of dollars. Vast and important as these products are, if we leave out

cotton and tobacco it will be found that the most of this is consumed at home and only a very small portion is exported. The value of the crops in the United States for 1880, the last we have the data for, and which is probably near enough for a fair yearly average, so far as the following products were concerned, was as follows:

Wheat.....	\$554,886,003	Barley.....	\$28,002,515
Corn.....	948,023,868	Potatoes.....	120,882,550
Rye.....	24,000,931	Hay.....	588,797,072
Oats.....	193,898,816		
		Total.....	\$2,458,491,755

Of all these there were exported products to the value of only \$262,493,689; the rest was consumed at home. The percentage of the above products exported was 10.63, and of that consumed at home, 89.32. This, as will be seen, does not include the buckwheat, beets, carrots, peas, beans, sweet potatoes, cabbage, turnips, tomatoes, pumpkins, asparagus, egg-plants, apples, peaches, pears, cherries, plums, grapes, strawberries, raspberries, blackberries, cranberries, melons, onions, and other vegetables and fruits which are raised all over the country, and which in value amount in the aggregate to millions of dollars every year, none of which, comparatively speaking, is exported, but all are consumed at home. If you take these into your calculation it will be safe to say that, of the agricultural products raised by our farmers in the Western and Northern States of the Union, *not more than eight per cent. is exported, and ninety-two per cent. of all they raise on their farms is consumed at home.*

Whilst we would not undervalue nor treat with indifference the foreign market, but cultivate and encourage it as much as possible, its insignificance is seen to the farmer as compared with the home market; the one takes not less than ninety-two per cent. and the other not more than eight per cent. of his products.

Next to a fertile and productive soil the farmer requires a market in which to dispose of the surplus produce. His money comes from his surplus crops. His wheat, his corn, and his potatoes are so much money to him. His income is based upon the number of his bushels. To derive the most from his crops he requires a certain and reliable market. This is necessary to make his farming productive and remunerative, and the more certain and steady it is the better he can calculate, and the more sure will be his return. He also wants a near market. The heaviest tax on a farmer is that which he pays for

getting his crops to market ; therefore, the nearer the market the less the cost. The home market is nearer than a foreign market, hence less expensive, and, being at home, is more certain and reliable. The people of a town, city or manufactory must be fed, and the farmer can calculate with some degree of certainty as to what they will require. The foreign market is always uncertain ; dependent upon the foreign harvest as well as other contingencies. If their harvest should be bad they want much to make up the deficiency ; if it proves to be good they want but little. In the foreign market there are also other elements which affect it. Competition is one. Other nations are as ready as we to supply their wants, and if they can undersell us the foreigner buys of them and not of us.

From this brief review it will be seen that the home market is the farmer's main dependence. It buys more than nine-tenths of all he has to sell. It is more steady and secure ; therefore, more reliable. It is nearer to him, and therefore costs less to transport to it. It follows, then, that in the interest of agriculture everything should be done to stimulate and increase this market. There is nothing the State can do which will be of more benefit to the farmer. If protective duties tend to do this by building up manufacturers, and giving employment to labor, then protection benefits the farmer—the Western no less than the Eastern farmer.

The farmer should be protected. Nothing should be left undone that would help or encourage him in his pursuits. Every possible aid should be extended to him to stimulate his efforts and enlarge his capacity to produce. Safeguards should be thrown around him ; and wherever a protective duty will help him the State should impose it for his benefit. Our present laws have been framed especially with this view. The present tariff laws impose the following direct protective duties on agricultural products : Rice cleaned, $2\frac{1}{2}$ cents per pound ; wheat, 20 cents per bushel ; Indian corn, 10 cents per bushel ; oats, 10 cents per bushel ; rye, 15 cents per bushel ; barley, 15 cents per bushel ; butter, 4 cents per pound ; cheese, 4 cents per pound ; potatoes, 15 cents per bushel ; poultry, 10 per cent. in value ; peas, from 10 to 20 per cent. ; beans, from 10 to 20 per cent. ; tobacco, unmanufactured, 35 cents per pound ; unstemmed, 50 cents, in addition to a revenue duty of 24 cents per pound ; sugar, 2 to 5 cents per pound ; on horses, cows, bulls, oxen, steers, calves, sheep, lambs, goats, hogs, and pigs, except for breeding purposes, 20 per cent. ; those for

breeding purposes are admitted free to benefit the farmers ; beef and pork, 1 cent per pound ; mutton, 10 per cent. ; wood, from 10 to 12 cents per pound and from 10 to 12 per cent. added ; and hay, 20 per cent. This is as it should be. These duties tend to keep out foreign competitors, and leave our home market almost exclusively free for our own farmers.

As an illustration of the working of the American system of protection in the interest of the farmer, let us take as an example one of the industries of the country. We will take the silk industry in the State of New Jersey. There were last year (1881) 14,122 persons employed in this business ; some in Paterson, some in Passaic, some in Hoboken, some in Newark, and some in other parts of the State. Many, indeed most, of these persons have others dependent upon them. Men have families, and girls have parents who live from the wages earned in the mills. If you assume that each of these persons has two others dependent upon him or her, and who thus live from the wages earned, it will make 42,366 people who are living in New Jersey from this one industry alone.

Now suppose all these people should be gathered together in one town ; they would make a large city of themselves. But when you put them together in a town you create the necessity for other persons living with them. They would want churches for religious worship, and clergymen to preach ; school-houses, and teachers to instruct their children ; carpenters, masons, plasterers, and painters, to build and keep the houses in repair ; cabinetmakers to manufacture furniture ; shoemakers, tailors, and hatters to make clothing ; wheelwrights, blacksmiths, and carriage and harness makers ; storekeepers, butchers, and bakers to feed the people, and supply the necessities of life ; doctors and lawyers, hackmen and day laborers. You must have banks and insurance offices. Nor is this all. There must be some kind of government and men to carry it on. Your police, fire, light, water, and tax departments would require many men. With all these and those dependent upon them you would swell your city to not less than 65,000 people, all of whom, either directly or indirectly, would be dependent upon this one industry ; and all of whom, every man, woman and child, whether working in the mill, attending school, engaged in building houses, making clothes, baking bread, tending the stores, ministering to the sick, or performing police duty, would be fed by the farmer. Now, although not all gathered in one city, so

far as our State is concerned, this one industry gives employment to and supports, directly and indirectly, this number of persons scattered up and down in different locations of the State. And the farmers feed them. And so with every other manufacturing industry, not only in the State of New Jersey, but in the whole United States; the farmer not only feeds them and all those dependent upon them, but all the other persons who live off of them, whether as lawyers, doctors, teachers, storekeepers, butchers, bakers, tailors, dressmakers, carters, or mechanics.

Newark, with its 136,508 inhabitants, is made up almost entirely of people dependent upon manufactures. There are varied manufactures, embracing almost every description of goods that the inventive genius of man can devise or conceive, from a needle to an anchor. The yearly value of the manufactured products of this city, as shown by the last census, amounts to \$66,243,525. The town rests upon its manufacturing industry, and all the people in it are fed by the farmer. So with Paterson, Millville and other cities in the State, as well as other cities and districts all over the country. There are seventeen cities in New Jersey containing 524,795 people, nearly all of whom are either directly or indirectly dependent upon the manufactories in them, and all of whom are fed by the farmers.

The manufactured commodities of New York and Brooklyn alone, as shown by the last census, amount yearly to \$617,966,838, and probably the manufactured products within a radius of twenty miles from where I now stand amount yearly to \$800,000,000. And it is these cities and towns all over the country, made up mainly as they are of manufacturers, merchants, artificers, and those dependent upon them, that make and constitute the home market for the farmer. The produce is furnished by the farmer; the price is paid by the consumer and constitutes the farmer's income. The manufacturers, by giving employment to labor, create the consumers, and protection builds up the manufactories; hence, it follows that the more manufacturers you have the more consumers there will be, and the more extended and better the farmer's market, both as to the quantity required and the price he will be able to obtain. Therefore, as has been seen, when you protect the manufacturer you help the farmer; and you cannot help the one without benefiting the other.

There is another element that comes in here; our system is one of protection to labor. The protection we give goes indirectly into the

pockets of the operatives; it enables the manufacturer to pay more to labor. Hence it is that our operatives, as a whole, are paid wages nearly double what they are paid in England. Receiving more wages for his work, a laborer in this country lives better than a like laborer in England; he is better housed, better clothed and better fed. He becomes, therefore, a better customer to the farmer, consuming more agricultural products than a like laborer in England. A thousand operatives in the United States consume at least a third more agricultural products than a like number of operatives in England.

I have selected this as the subject of my address because of the systematic efforts on the part of England and others to misrepresent this question before our people, with the view of prejudicing our farmers against the manufacturing industry of the country. For years England has been proclaiming that our farmers have no protection under our tariff laws, and that whilst this is the case they have been unduly taxed to support the manufacturers; that the government has neglected and left them and the great industry they represent without any protection, and extended and given protection to the manufacturer, which has had the effect to put up the prices of manufactured goods much higher than they would have been if there had been no protection; and that the farmer has had to pay this increased price on the goods he has had to buy, which, in the course of the year, amounts to a very large sum, which is wrongfully taken from him.

Their statesmen, their politicians and their newspapers have persistently asserted and reiterated these statements. The Cobden Club, an institution representing the manufacturers of England, established to break down the protective system, especially that in the United States, has been most industrious in circulating documents and statements to this effect all over the country. They have gone so far as to establish an agency in New York and another in Chicago to carry on their work in the United States.

Now, nothing is more untrue than these assertions and statements, yet these people go on from day to day and year to year circulating these falsehoods. So late as July 1st of the present year, Lord Derby, while presiding at the Cobden Club dinner held in London, in commenting upon our system, says he regrets that it is protective, but asserts, "that sooner or later free trade must become a sectional question in the United States," and then goes on to say, "*the Western farmer*

will not always enjoy the notion of paying tribute to Eastern manufacturers." This is but one of many utterances of a like nature by their statesmen and politicians, besides their books, pamphlets and editorials, gotten up to array one section of our country against the other, and one class of industry against another; in other words, to use the language of Lord Derby, to make the tariff a sectional question by arraying the Western States against the Eastern States, and the farmers against the manufacturers.

If it were true that our farmers received no direct protection on their products, or were unduly taxed by the Government, or were in any way oppressed as these Englishmen have represented, no one would object to any fair and proper criticism among themselves. As a people and a nation they would have the right to express their views and condemn the wrong; but even then how far would England or any other nation be justified in direct interference with our affairs or institutions with the view of correcting what they considered to be abuses?

How would such outside interference be regarded in England if directed against any of their laws or institutions? Suppose our people were to engage in the laudable work of arraying one section of England against the other, or one class of her people against another class, how would they look upon it? Would they not characterize it as an unwarranted piece of interference? But when, as has been done, false figures are used, and untrue statements are made, and books are published and circulated among our people based upon these false figures and statements, for the very purpose of arraying section against section, and class against class, it seems to me that no language can be too strong in denunciation of such conduct. Viewed only as an attempt to instruct our people on a question of political economy, without any misrepresentation of facts, and without any ulterior object, it would be a piece of great assurance on their part, if not an insult to the intelligence of our people, because it assumes that we are incapable of forming a correct judgment for ourselves.

Would it not be just as well and probably pay better in the end, if some of this misapplied effort and zeal on their part were directed toward alleviating and helping the poor and oppressed people of Ireland and their own country, including the agriculturists? There is here a wide field for labor, quite enough to occupy their time and to exercise all their philanthropy without wasting it on us. James

Redpath, in speaking recently of England's conduct and actions toward the United States, used this significant language: "Enlightened selfishness should teach us to suspect any *policy* our enemy advocates." There never was a time when there was greater cause to suspect England than the present on a question it was more to her interest to misrepresent than the one we are considering. It will not be necessary to go very far to discover the motive for all this disinterested love on her part for our poor farmers.

The policy of our present tariff laws is to protect labor and industry. This is the American System, and under it the manufacturing business of our country has been increased and multiplied in numbers, varied in kind, and improved in quality to such an extent that, of the manufactured commodities now used and consumed in this country, over ninety-one per cent. is manufactured at home, and less than nine per cent. is made or imported from abroad. We have not the value of the manufactured commodities of the country by the census of 1880. It is not yet entirely completed. But it is supposed that it will amount to at least \$6,500,000,000. During the fiscal year 1881 we exported from this country manufactured commodities amounting to \$229,940,238. That would leave our manufactured products consumed in the country for the year 1880 about \$6,270,000,000. With the yearly increase of manufactured commodities it is not likely that even with the increased exports there was a less balance left at home for consumption and use during the year 1881.

The whole amount of merchandise we imported for the year 1880 was valued at \$667,954,746. Of this not more than \$450,000,000 were manufactured commodities. Supposing that the whole of these were consumed here, it only forms about seven per cent. of the manufactured products used and consumed in the country. From the partial statistics we have for 1881 it is not probable that the percentage of the foreign manufactured products imported and consumed here was any larger than it was for the year 1880.

We have, then, the astounding result that of the manufactured commodities used in this country less than eight per cent. are imported, and more than ninety-two per cent. are manufactured here. How was it thirty years ago? It has been computed that of the manufactured commodities then used in the country ninety per cent. were made abroad, the larger portion in England, and only about ten per cent. were manufactured at home. And with this great and astonishing

change, and the large increase in the consumption of manufactured commodities since that period, we have this additional result, namely, that nearly every kind and description of manufactured commodities is cheaper to-day than it was thirty or even twenty-five years ago.

The result to the farmer of our country may be summed up as follows: Of the crops he raises, outside of tobacco and cotton, ninety-two per cent. is consumed at home, and not more than eight per cent. is exported; and he can buy all the manufactured commodities he requires for less than he could twenty-five years ago, before the present protective laws were enacted, and many of them even cheaper than they can be bought in any foreign market.

As one proof of this you have only to look over the exports from our country to foreign countries of our manufactured commodities. We are sending to other nations yearly our agricultural implements, including fanning mills, horse-powers, mowers and reapers, plows, cultivators, forks, hoes, etc., carriages, carts, cotton goods, railroad cars, locomotives, steam engines, watches, clocks, glass and glassware, hats, caps, boots, shoes, wearing apparel, machinery, cutlery, edge tools, files, saws, firearms, nails, India rubber goods, jewelry, lamps, saddlery, harness, organs, piano fortes, paper, stationery, printing presses, sewing machines, household goods, furniture, woodwork, tinware, and scales.

As a rule men do not export goods to another country to be sold at a loss, and when you see a manufacturer sending his goods to a foreign country steadily for a succession of years, it is fair to presume that he does it because he can get more there than he can at home; in other words, that they are cheaper here than in the foreign country to which they are exported. During the fiscal year 1880, we exported to foreign countries \$206,000,000 of our manufactured commodities; and during last year nearly \$230,000,000, whilst in 1868 our exports only amounted to \$68,000,000.

We are steadily, year by year, increasing the variety and quality as well as the quantity we are sending abroad. Among these last year were over 148,000,000 yards of cotton goods, and nearly 400,000 clocks. If you will go to the leading dry goods stores in Liverpool and Manchester you will find hundreds of pieces of our cotton goods being sold, equal in quality and texture to any they are making in England, and at less price than they can sell those of their own manufacture; whilst the "Yankee clocks," as they call them, are scattered all over their country. Our agricultural tools and imple-

ments, our axes, our edge tools, our machines, and hundreds of other kinds of manufactured commodities, are found for sale in every town of any size in the kingdom. We are, therefore, not only competing with England in all the markets of the world, but competing with her in her own markets at home.

English statesmen and politicians have discovered these facts, and are beginning to realize that England is no longer the only manufacturing country in the world.

But this is not all. The food question has become a serious one in England. She does not and can not raise sufficient food to feed her own people. There is not one single article of food that she can raise in sufficient quantity and that she does not have to buy of foreign nations. In 1880, for ten common articles of food which we have in abundance, not only for our own wants but in sufficient quantity to supply others, she bought and paid as follows:

Live animals, consisting of		Eggs.....	£2,235,451
oxen, bulls, cows, calves,		Fish.....	1,666,710
sheep and lambs.....	£10,060,396	Lard.....	1,852,160
Meat.....	16,429,567	Potatoes.....	2,847,027
Butter.....	12,141,034	Rice.....	3,755,199
Cheese.....	5,091,514		
Corn, wheat, etc.....	62,857,269	Total.....	£118,936,327

This is equal to \$575,652,113 in our money. In 1860, twenty years ago, for these ten articles of food which she imported she paid £43,997,849, or, in our money, \$212,949,589. In 1875 they had increased to £91,974,527, or, in our money, \$445,155,710; whilst in 1880 they had swelled to the enormous sum of \$575,652,113. This does not include teas, coffee, cocoa, spices, fruits, vegetables, and other articles of food which she imports in large quantities, and for which she pays enormous sums, and which, like those we have enumerated in detail, are increasing in quantity year after year until the matter of feeding her people, as well as supplying them with work, has become a serious question. England to-day has to face these two dangers: one, the loss of the markets of the world for her manufactured commodities; the other, the exhaustion of her resources in the purchase of food to feed her people. If she could but continue, as she has done in the past, to manufacture for the world, she might be able to stand the other at least for a time.

It will thus be seen that what England requires is cheap food and a market for her manufactured commodities. She could then feed

her people cheaply and save the immense drain upon her resources for food, and give employment to her people. She would then make on both sides. She would save money in the purchase of food, and make money on the labor of her people; both of which, the money she saved and that she made on labor, would go to swell the accumulated capital of the country. The effect would be to restore prosperity, and check the downward tendency in her commercial greatness which is now apparent, and which, if not checked, will sooner or later bring bankruptcy, if not ruin. Nothing will do so much toward accomplishing this result for her as the repeal of our tariff system and the consequent destruction of our manufactories. To bring this about, England can well afford to spend money to establish Cobden Clubs, engage writers and circulate books in the United States; in a word, to do just what she is and has been doing.

We have seen what the gain would be to England if she could but carry out her schemes. Now let us look at the other side and see what the effect would be on us, and especially on our farmers, and the agricultural industry of the United States. I say our farmers, because it is to the farmers that these appeals are made by the English. It is this class that they are trying to array against the manufacturers. This is the sectional party that Lord Derby and his co-laborers are trying to build up in this country. We have seen, that of the agricultural products raised in the Northern and Western States, more than ninety-one per cent. is consumed in the country and mainly by the manufacturers and artisans and those dependent upon them, whilst less than nine per cent. is exported.

Suppose, then, that you break down the American system, and introduce the English system, to wit, a tariff for revenue only, in its place, and the result which the English are working to accomplish follows, viz., the destruction of our manufacturers. What would the consequence be, especially to our farmers? Suppose only one-half of our manufacturers should go down and the rest remain. Your home market would be destroyed to this extent: the operatives now employed when turned out could not purchase your products. Their means to buy are acquired in the mills, and when the mills stop their pay would stop, and they could no longer purchase. What then would be done with the products which they now take? Would England take them? She would then, as now, take just what she required to feed her own people, and no more. The market at home

would be glutted by this excess, and the prices would go down, and the English could then fill their orders at the reduced price—at probably one-half they now have to pay.

How would this benefit the farmer? The Western farmer who owns a farm containing two hundred acres could not then raise one single bushel more of corn or wheat than he does now. Supposing his crop of wheat to be 2,000 bushels, and his corn to be 3,000 bushels, one year with another. To-day he could get \$2,000 for the one, and \$1,500 for the other. That would make the gross receipts from these two staples \$3,500. Now suppose, from the destruction of the manufacturers and the glut in the market, you only reduced the price one-fourth (but the chances are the reduction would be much greater), what would be the result? He would lose just \$875. The crops which to-day are worth \$3,500 would then be worth only \$2,625. To this extent the farmer would lose, and to this extent England would gain; in other words, the farmer would lose \$875 in selling and England would save just that much in buying. And this would apply with equal force and effect to every farmer in the country, whether he lived in the East or West.

But this is not all. What is to become of the people who are turned out of employment by stopping the manufactories? Lord Derby and his co-laborers will tell you they are to go to farming. This is what they expect them to do, and this, in point of fact, would be the only pursuit most of them could turn to. No persons understand this better than our English friends. Indeed, it is a part of their scheme as far as they can to turn all these people into agriculturists. If they should succeed in this the effect would be still more to glut the market and still more to depress prices. These people who are now among the best customers of the farmers would become producers instead of consumers; sellers instead of buyers; competitors instead of customers.

The wealth of the farmer consists in the number of bushels he raises; his power to buy upon the price he can obtain; and the price is regulated very much by the supply and demand. If the supply is greater than the demand, the price goes down; if the supply is less, the price goes up. But our English friends would say after you repeal your protective system you can buy all your manufactured commodities in England at a less price than you are now paying. The appeals they are making to our farmers are based upon this.

They say: "Under your protective system your farmers are paying much more than they would have to pay if there was no protection, and in this way they are being unduly taxed to support the manufacturers."

We have seen what the effect of the repeal of our tariff system would be upon the farmer in the destruction of the home market, and how it would reduce his means, and therefore limit his power to buy; although he might have just as many bushels to sell, he could not obtain as many dollars for them. Let us see how much truth there is in the statement that our farmers could then buy the goods and commodities they required in England cheaper than they can now buy them in the United States. And in this connection I would first remark that manufactured commodities taken as a whole were never lower in price in this country than they are at the present time, and that in the aggregate they are at least twenty-five per cent. cheaper to-day than they were in 1860 before the present protective tariff was enacted. Protection has created domestic competition and thus cheapened the price. And this has extended so far that most of the manufactured commodities now used by our farmers are as cheap in the United States as they are in England; are now being sold in our stores at as low prices as they can be purchased for in the stores in England.

This applies to the cotton goods the farmer uses for domestic purposes, whether as clothing for himself and his family or that which he uses for household purposes; to all descriptions of household furniture; to the clock that hangs on the wall; to the watch that he carries in his pocket; to the boots and shoes he wears; to the hat that covers his head; to all descriptions of wooden ware; to carriages, wagons, carts, barrows, harness, and all agricultural machinery; to tools and implements, including reapers, mowers, threshers, rakes, rollers, plows, harrows, cultivators, drills, forks, hoes, shovels, spades, and every other description of agricultural tools, implements and machines. It also applies to much of the cutlery, crockery, glass and tinware that he uses, as well as his kettles, pots and pans; to all descriptions of edge tools, including the axe. And in some instances these things are even much cheaper here than they are in England. And as to food, whether bread, meat, vegetables, or fruit, it is cheaper here and in more abundance than in any country in Europe.

The tea and coffee he drinks are cheaper here than in England, for there these articles of everyday life used by laboring men are taxed;

and the poor man in England who earns but a dollar a day, and drinks his cup of tea or coffee before he begins or at the close of his day's labor, pays just as much of this tax as the rich man who drinks his cup of either at the beginning or close of the day. The prince and the peasant, though the one rolls in wealth and the other lives in squalid poverty, each pays an equal amount of this tax on the tea or coffee he drinks.

Now how would the repeal of our protective system cheapen the price of any of these things which I have enumerated, and which comprise at least nine-tenths of all the manufactured commodities our farmers taken as a whole purchase or use? They are as cheap in the United States at the present time as they are in England. Our farmers are now paying no more for them than the English farmer is paying for the same class and description of these goods. Is it likely that the repeal would reduce the price? No one will pretend this.

Suppose the English were to continue, after the destruction of our manufactures, to sell to us at the same prices they are now selling. The farmer would have to pay the additional cost of shipment and transportation across the ocean, and this would to that extent increase the price and make it just that much more than he is now paying. But when they succeed in breaking down our manufactures what security have you that they will continue to sell us at the same prices they are now selling?

The price of manufactured commodities, like agricultural products, depends very much upon the supply and demand. By the destruction of the manufactures in the United States you would lessen the supply here and increase the demand there. Our people would then have to buy of England what they now make at home. This would give England just this many more customers than she now has, and she would require this quantity more of manufactured commodities to supply the demand. This, according to all the laws of trade, would put up the price, and the Western farmers and others would have to pay this advance or increase of price upon all the manufactured goods which they require.

No one understands this better than Lord Derby and our other English friends. Now suppose all this should be brought about. England would then have accomplished what she is striving to attain, namely, cheaper food to feed her people and a more extended and better market in which to sell her manufactured com-

modities. She would be enabled to sell much more and at better prices, and save in the food she now has to buy, and her gain would be enormous. It would amount to hundreds of millions of dollars every year. This would not be tribute to the Eastern manufacturers that we should then be paying, but tribute to England; and no class of society would pay more of this tribute than the farmers of America. And any tax or duty they now pay, or all the taxes of every kind which they now pay, if put together, would not amount to the one-half of this tribute which they would then be paying to England. For everything they had to sell they would get less, and for everything they had to buy of manufactured commodities they would have to pay more.

And the farmer would not be the only one to suffer. The loss would fall upon others as well. The whole country would lose, and the loss would be almost beyond computation, not only in the shrinkage of the value of our agricultural products, but in the diminution of our manufactured commodities. In the latter alone, if there should be only one-fourth of our manufactories stopped, the direct loss would amount to nearly if not quite \$2,000,000,000 a year.

No civilized country has been or ever will be prosperous and great without a diversity of industrial pursuits. You might as well expect prosperity for the farmers of a country if they were all to grow but one crop, (corn, for instance, and nothing else,) as to expect a nation to be prosperous and great if all the people were to be engaged in but one industry, even if that industry should be agriculture. The capital of a country should always be so employed as to yield or make the largest return. The more productive it is made the greater will be the prosperity of the nation. The productiveness of capital marks the nation's prosperity. If an excess of capital should be thrown into one industry there would be an over-production in that industry, and prices would fall, and loss ensue; and all the other industries would be to a greater or less extent affected by this loss. If, however, capital should be so distributed as to stimulate and develop all the industries alike, and in this way give employment to all the people, there would be gain instead of loss; and the gain would be high wages to labor, and prosperity to the nation, whilst the loss would be low wages and national ruin.

Especial care should always be taken in every system so as to pay the most that can be paid to labor. The American system of protec-

tion aims at this ; its main object being to protect labor and to give it the largest possible return—the largest that can be given consistent with the cost of production. Its effects are to divide capital and distribute the largest proportion of the products of the earth among the people. This is done at the expense of the few for the benefit of the many ; at the expense of capital for the benefit of labor. And this is as it should be, for it enables man to be a man, and live as a human being ought to live, as God intended he should live.

The English system is the contrary of ours ; it does not aim to protect labor, but to protect capital as distinguished from labor ; it does not distribute wealth to the many, but to the few at the expense of the many. Its effect has been to accumulate wealth in the hands of capitalists, to make the rich man richer and the poor man still more poor, until they have arrived in England at a condition in society which quite justified one of her most able and gifted statesmen, when speaking of her people, in saying that they had on the one end a grand and magnificent aristocracy and on the other a double-headed pauperism.

Farmers of America, if you desire this, then listen to these pretended English friends of yours, and adopt their system—a tariff for revenue only ; or go still further, and adopt Free Trade pure and simple, not as they have it, for although their writers have recommended it, and their statesmen have commended it to other nations, they themselves have never adopted it, and no civilized nation ever has ; and you will then have taken the first step toward attaining a result, if not the same as theirs, still more disastrous to yourselves and your country. If, on the other hand, you wish to preserve your own prosperity, and desire also to see your country continue prosperous and great, stand by the American system of protection which has placed the agriculturists of the United States among the first in the world ; has paid and elevated labor ; and made your own nation not only one of the most civilized and prosperous, but one of the most powerful and great, that exists on the earth.

FARM OF NEW JERSEY AGRICULTURAL COLLEGE.

REPORT FOR THE YEAR 1881-2.

BY GEORGE H. COOK.

THE WEATHER AND THE SEASONS.

The season of 1881 was notable for its long and severe drought. While the immediate effects of the drought were felt in the shortness of the crops and in the drying up of the fall pastures, it was thought that there would be some compensating advantages in the drawing up of saline matters from below and in storing them in the subsoil and soil. It is too soon to observe any beneficial results, although in general the crops have been better than they were in 1881. The winter of 1881-'82 was one of the warmest on record here. The mean temperature was 34.96° , or five degrees above the average for our winter. December was remarkably mild and without any cold waves. In January there was a depression on the 24th to 3° below zero, the minimum of the winter. February, like December, was mild and even. The total rain-fall of the season was 12.94 inches, or about the usual depth. But the greater part of the moisture precipitated was in rain. The snows were light and the ground was bare throughout December and during much of January and February. The winter grain had grown well during the fall, and the absence of extreme cold favored it, so that when spring opened and the weather began to grow warm it looked well and started up at once. But the spring was wet and backward. March was three degrees only warmer than February, and there were cold days late in the month. The mean temperature of the spring was 3° below the average; that of May being 8° below its mean for many years past.

The growth of all summer crops was slow in consequence of the cold season. The first part of June was more like May, and the average summer heat did not come until after the middle of the month. From that time on the summer was warm and dry. The rain-fall of June was much below the average; that of July was 3.04 inches; and the total for the calendar summer months amounted to 7.72 inches, or scarcely one-half the average quantity. The drought came earlier than in 1881 and was not so prolonged into the autumn, but it affected the corn and potato crops seriously. The winter grain and the oats were not hurt to any extent. The wheat harvest was favored by the dry weather. Near the end of August the season changed to cooler and wet weather. There were frequent rains throughout September, and the memorable equinoctial storm of the 21st to 24th inclusive, during which the rain-fall amounted to 12.03 inches. But the rains came too late to revive the corn, and the yield of that crop was 50 per cent. below its average per acre. The potato crop, also, was short. The pastures came up wonderfully and there was an abundance throughout the autumn for all stock feeding upon them. The severe and heavy rains washed out the fields in many places and thus interfered with some early sowed grain. The overflows did much damage on low grounds exposed to freshets. The aggregate losses in this way were very large, particularly in the central part of the State. The autumn following this equinoctial storm was unusually mild and equable. There were frequent though light rains. And the autumn rain-fall was but little more than that usually received, although that for September was unprecedented in depth. First killing frost did not come until about the middle of November. The growing season was prolonged late and was a long one. The fall-sowed grain did well as the ground continued moist, notwithstanding the light rains of October and November. And the grass or fall pastures were in fine condition and afforded stock all they needed until the snow of the 29th covered them. The season may be said to have closed at that date.

TEMPERATURE AT COLLEGE FARM.

MONTHS.	1882.			1863-1870 & 1876-1882.		
	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.
January	48	-3	29.5	67	-12	28.4
February	55	15	35.5	67	-10	30.3
March	59	23	38.9	77	4	36.8
April	76	27	44.3	81	21	48.2
May	83	35	51.7	98	37	58.4
June	95	54	67.8	98	46	68.0
July	91	59	70.7	101	56	74.6
August	93	54	69.5	99	48	71.9
September	90	50	64.7	103	42	65.4
October	78	41	56.2	89	29	54.2
November	71	16	37.2	74	11	39.1
	1881.			1863-1870 & 1876-1882.		
December	61	19	39.8	65	-8	31.7
Year	95	-3	50.48	103	-12	50.58
Range		98			115	

RAIN-FALL AT NEW BRUNSWICK.

The rain-fall (including melted snow) in the table here given is from the record kept by P. V. Spader, Esq. The average for the term, 1854-1882, is made from observations at the College to the end of 1867; the years since are from Mr. Spader's record.

MONTHS.	1854-1882.	1882.
	Inches.	Inches.
January	3.43	5.49
February	3.18	4.24
March	3.55	2.62
April	3.75	2.83
May	3.87	5.29
June	3.92	1.48
July	4.72	3.04
August	4.78	3.20
September	3.74	15.52
October	3.30	1.42
November	3.69	1.60
December	3.47*	3.92†
Year	45.40	50.65

* Not including December, 1881.

† December, 1881.

CROPS.

Of the 97 4-10 acres in the farm there have been 92 acres in use. The remainder is occupied with roads, buildings, cattle and hog yards, and the fish-pond. The following are the crops which have been grown on the farm during the year :

	Acres.
Wheat	9.54
Rye.....	7.05
Oats.....	13.20
Corn	16.00
Sorghum.....	1.60
Potatoes.....	1.00
Clover and Timothy.....	31.00
Fodder-Corn	6.10
Pasture	5.76
Garden vegetables	0.75
	<hr/>
	92.00

Turnips, second crop, one acre.

Wheat—The very dry weather at the time of sowing last year prevented the germination of the wheat for several weeks, and when it sprouted it came up very unevenly. It was not supposed that we could have a half crop, but favorable weather in December gave it time for some unusual growth. On the whole field we harvested 259 bushels, which is at the rate of twenty-seven bushels per acre. The variety grown was the Fultz.

The wheat ground was fertilized with nearly 300 lbs. of Lister's ammoniated superphosphate, drilled in with the seed.

Rye—This crop is grown either for green fodder, or else because the time of sowing is too late for wheat. A part of the past year's growth was cut and fed to cows green, another part was ensilaged, and is still to be tested for fodder—and only about two and a quarter acres were harvested for the grain. From this seventy-eight bushels were threshed, which is at the rate of thirty-four bushels per acre. The growing rye which was first cut, sprouted again, and some of it headed out and ripened. The grain is small and the crop is not yet threshed out.

No manure was applied to the ground for the rye crop.

As green fodder the rye can be cut when the heads first appear,

about May 10th, and the cutting can be continued until the straw is too hard for cattle to eat, which is early in June. The weight of the crop on very rich ground is from three to nine tons per acre.

Oats—Last year's corn ground was sown with oats. The straw grew so large and heavy that much of it was lodged early, greatly to the damage of the crop of grain. The yield was 430 bushels, which is thirty-nine bushels per acre.

There was no manure used in growing this crop.

Indian Corn—This was mostly planted on very flat ground, some of which was the best on the farm. The pinching drought came just as the corn was tasseling, when rain was most needed, and the crop was greatly damaged. The husked corn weighed 40,700 pounds, which, at eighty pounds for a bushel, is 509 bushels, or thirty-two bushels per acre. The corn ground was manured from the barnyard.

Sorghum—This was grown simply for experimental purposes, and details of its cultivation will be found under the head of experiments.

Potatoes—This crop was better than common with us. 150 bushels were harvested from a single acre. The ground on which they were grown was in sod the preceding season, and was plowed after the mowing, and then a crop of turnips was taken off. The ground was well manured from the barnyard.

Clover and Timothy—The dry weather of 1880 was so severe as to kill the roots of much of our clover and timothy, and it would have been better to plow up most of the ground in meadow, if it had been possible. The whole crop of hay was not more than thirty tons, or about a ton to the acre. No top-dressing was applied to the ground for this crop.

Fodder Corn—Most of this crop was consumed in soiling the cows. A portion however was cut, put in small shocks like ordinary corn shocks, and is now dry and ready to be cut and fed to cattle. Another portion was cut at the same time and then put through the machine for cutting and crushing it for ensilage, and it is now in the silo ready for feeding.

The ground was heavily manured for the fodder corn, and the crop was a good one, considering the drought to which it was exposed. Something further will be said upon this topic under ensilage.

Turnips—After the potatoes were dug, the ground was plowed and sown broadcast without further manuring, with turnip seed. Cow-horn and Yellow Globe turnips were grown, and the crop was 225 bushels. The Yellow Globe crop was the best.

Pasture—This was of not much value, except as a place of exercise for the cows, which were kept, most of the time, in stanchions, in the stables.

STOCK.

Forty cows are kept on the farm at this time. No attempt is made at present to breed fine stock. The means of the farm do not allow of it. A few Ayrshires are in the herd, but most of the cows are of the native stock, though some are crossed with Shorthorn, Devon or other imported breeds. They are kept up in stables, and receive green fodder during the season of it.

Eighty thousand three hundred and fifty-eight quarts of milk have been sold at wholesale in Jersey City during the year from December 1st, 1881, to December 1st, 1882. And have been retailed in New Brunswick 39,192 quarts in the same time.

A few pigs are kept, but not of any pure breed.

A pair of mules and three horses are kept for the use of the farm, and one horse for the delivery of milk in town.

EXPERIMENTS.

Oats—The one-tenth of acre plots on which Indian corn with special chemical fertilizers was grown last year, were again dressed with the same fertilizers as before and sown with oats in the spring of the present year. The following table shows the fertilizers used and the product of oats and straw per acre. The legal weight of thirty pounds being accounted a bushel.

TABLE—OATS.

Number of Plot.	FERTILIZERS.			YIELD PER ACRE.			
	KIND.	Amount per Acre.	Cost per Acre.	Grain.		Straw.	Pounds per Bushel.
		Pounds.		Pounds.	Bushels.	Pounds.	
1	Nothing			925	31	1,675	31
2	Nitrate of Soda.....	150	\$5 85	880	29	1,720	32
3	Superphosphate.....	350	5 25	1,080	36	1,820	32
4	Muriate of Potash.....	150	3 75	1,090	36	2,030	33
5	{ Nitrate of Soda.....	150	500	1,470	49	2,200	34
6	{ Superphosphate.....	350					
7	Nothing			1,150	38	1,600	32
8	{ Nitrate of Soda.....	150	300	1,350	45	2,100	34½
9	{ Muriate of Potash.....	150					
10	{ Superphosphate.....	350	500	1,460	49	2,090	35
11	{ Muriate of Potash.....	150					
12	{ Nitrate of Soda.....	150	650	1,730	58	2,770	35
13	{ Superphosphate.....	350					
14	{ Muriate of Potash.....	150	400	1,290	43	1,610	31½
15	{ Plaster.....	400					
16	Fine Barnyard Manure..	{ 20 2-horse loads. }	30 00	1,750	58	2,850	35

This is the first trial of fertilizers for oats on the College farm, and it is not prudent to draw any general conclusions from them. From this single trial it appears that none of the single fertilizers showed peculiarly marked effects,—neither did those in twos. The complete manure was equal to the barnyard manure, though it cost only half as much.

Indian Corn—The trials of various chemical fertilizers singly and in combination, in their effects upon the growth of Indian corn, have been repeated this year upon one-tenth of acre plots, the same as for several years past. The field in which the experimental plots were located, is one which was cleared and drained a few years since. The soil is undoubtedly of uniform composition, but some portions of it were a little lower than others, and had always been wetter when in forest, and when plowed the soil was lighter colored in some spots. Since it was cleared it has had the same cultivation and manuring throughout. The soil under the influence of drought, however, has

shown marked differences in quality. And the effects of the fertilizers have been modified more on some plots than on others by the lack of rain.

The following are the details of the fertilizers, their cost, and the product of corn and stalks per acre.

TABLE—INDIAN CORN.

Number of Plot.	FERTILIZERS.			YIELD PER ACRE.		
	KIND.	Amount per Acre.	Cost per Acre.	Ears.	Shelled Corn.	Stalks.
		Pounds.		Pounds.	Bushels.	Pounds.
1	Nothing.....	.....	.....	2,150	27	3,050
2	Nitrate of Soda.....	150	\$5 85	1,600	20	2,555
3	Superphosphate.....	350	5 25	1,700	21	3,050
4	Muriate of Potash.....	150	3 75	2,150	27	3,300
5	{ Nitrate of Soda.....	150 } 500	11 10	1,450	18	2,050
	{ Superphosphate.....	350 }				
6	Nothing.....	.....	.....	1,300	16	2,050
7	{ Nitrate of Soda.....	150 } 300	9 60	2,050	26	2,850
	{ Muriate of Potash.....	150 }				
8	{ Superphosphate.....	350 } 500	9 00	1,300	16	2,950
	{ Muriate of Potash.....	150 }				
9	{ Nitrate of Soda.....	150 } 650	14 85	2,000	25	3,550
	{ Superphosphate.....	350 }				
	{ Muriate of Potash.....	150 }				
10	Plaster.....	400	1 60	1,300	16	2,500
11	Fine Barnyard Manure. { 20 2-horse loads. }		30 00	2,600	33	4,000

The result of this experiment is so modified by the want of rain during the most important time of its growth, that conclusions from it cannot safely be drawn which would be applicable in the growing of corn in ordinary seasons. The single result which has been observed in all our experiments with fertilizers in corn growing for eleven years, is that the weight of stalks is increased by the use of muriate of potash. And it may be said that, as has been the case in former years, nitrogen in nitrate of soda or sulphate of ammonia does not increase the yield of corn.

Sorghum Sugar Cane—Experiments have been made in growing sorghum, in testing the influence of commercial fertilizers upon its

growth, its production of sugar, its product of seed, and its value for ensilage.

Sixteen plots of one-tenth of an acre each were laid off in the late autumn of 1881, and one-half of each plot was plowed and subsoiled. The remaining half plots were plowed in the spring, but not subsoiled. The fertilizers were sown broadcast on the 16th of May, and the seed, which was Early Amber, was planted the same day. It was planted in rows three and a-half feet apart. The growth of the cane was remarkably good until the middle of August, when it was stopped by the severe drought. The intense heat and drought checked the growth suddenly, so that though ready to head out, it did not put forth the usual large and expanded heads, but those which were short and imperfectly developed. At the close of the season when rains came, side shoots were put out, but it was too late for the seed to mature. The whole crop was much short of an average, but the seed was more deficient than the canes.

When the seed was ripened and hard, the stalks were still juicy and sweet, and several tons were cut and crushed for ensilage. This appears to be keeping well, and feeding experiments will be made with it in the course of the winter.

SORGHUM ON FALL-PLOWED GROUND.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	No Manure.	350 lbs. Superphosphate.	150 lbs. Nitrate of Soda.	150 lbs. Potassium Chloride.	350 lbs. Superphosphate. 150 lbs. Sodium Nitrate.	No Manure.	350 lbs. Superphosphate. 130 lbs. Potassium Chloride.	150 lbs. Sodium Nitrate. 150 lbs. Potassium Chloride.	350 lbs. Superphosphate. 150 lbs. Potassium Nitrate.	400 lbs. Calcium Sulphate.	20 two-horse loads Barnyard Manure.	200 lbs. Potassium Sulphate.	350 lbs. Superphosphate.	200 lbs. Potassium Sulphate. 150 lbs. Sodium Nitrate.	200 lbs. Potassium Sulphate. 150 lbs. Sodium Nitrate.	200 lbs. Potassium Sulphate. 150 lbs. Sodium Nitrate. 700 lbs. Superphosphate.
Cost of Fertilizer per acre.....	.....	\$5.25	\$5.85	\$3.75	\$11.10	.....	\$9.00	\$9.60	\$14.85	\$1.60	?	\$5.60	\$10.85	\$11.45	\$16.70	\$21.95
Pounds of Sorghum per acre.....	25980	25130	28280	33320	30160	29360	30450	31010	30710	25670	28740	25700	25290	23360	25900	29470
Pounds of Stripped and Topped Cane per acre.....	15874	19555	19344	21391	17583	16308	17509	16745	17351	15402	17905	15549	15073	14226	17145	19185
Tons of Stripped and Topped Cane per acre.....	7.93	7.78	9.67	10.70	8.79	8.18	8.75	8.37	8.68	7.70	8.95	7.77	7.53	7.11	8.70	8.80
Pounds of Extractable Juice in 100 lbs of Stripped and Topped Cane.....	43.1	44.2	42.3	42.3	38.1	39.1	41.3	36.6	38.5	37.8	39.6	39.1	37.8	36.	42.2	41.8
Pounds of Extractable Juice in one acre of Stripped and Topped Cane.....	6842	6875	8183	9048	6999	6400	7231	6129	5680	5822	7090	6460	5697	5121	7235	8019
Pounds of Sugar in 100 lbs of Juice.....	13.00	13.80	13.20	13.50	13.50	12.90	12.80	11.70	12.80	13.50	13.40	13.50	12.60	14.00	13.60	13.20
Pounds of Extractable Sugar per ton of Stripped and Topped Cane.....	112.0	118.0	112.	114.	104.	101.	106.	86	99	103	107	112	.95	101	122	123
Pounds of Extractable Sugar per acre of Cane.....	890	914.	1080	1221	904	826	926	717	855	786	950	872	718	717	984	1059
Co-efficient of Purity of Juice.....	74.7	76.1	74.8	77.	77.	74.1	76.	72.1	74.	76.1	76.	76.5	73.	77.5	75.	74.5
Pounds of Clean Seed per acre.....	675	730.	850	595	315	185	70	.....	90	275	310	385	350	480	655	560

SORGHUM ON SPRING-PLOWED GROUND.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cost of Fertilizer per acre.....	.....	\$5.25	\$5.85	\$3.75	\$11.10	No Manure.	350 lbs. Superphosphate. 150 lbs. Potassium Chloride.	150 lbs. Sodium Nitrate. 150 lbs. Potassium Chloride.	350 lbs. Superphosphate. 150 lbs. Potassium Nitrate.	400 lbs. Calcium Sulphate.	20 two-horse loads Barnyard Manure.	200 lbs. Potassium Sulphate.	350 lbs. Superphosphate. 200 lbs. Potassium Sulphate.	200 lbs. Potassium Sulphate. 150 lbs. Sodium Nitrate.	200 lbs. Potassium Sulphate. 150 lbs. Sodium Nitrate.	200 lbs. Superphosphate. 150 lbs. Sodium Nitrate.
Pounds of Sorghum per acre.....	29840	28180	31670	27140	32020	29740	31750	36370	37420	30920	29700	24320	23330	26030	31560	32800
Pounds of Stripped and Topped Cane per acre.....	20768	18514	20712	16203	19372	19003	20669	24704	24116	19418	19385	15200	14418	17831	21808	23009
Tons of Stripped and Topped Cane per acre.....	10.38	9.25	10.35	8.10	9.68	9.50	10.33	12.35	12.5	9.71	9.66	7.60	7.21	8.91	10.90	11.
Pounds of Extractable Juice in 100 lbs. of Stripped and Topped Cane.....	45.8	45.8	49.	39.5	43.5	43.5	47.8	49.1	47.	45.5	50.	42.5	40.5	43.7	44.6	43.1
Pounds of Extractable Juice in one acre of Cane.....	9512	8479	10149	6400	8427	8266	9880	12140	11334	8835	9668	6080	5839	7792	9726	9486
Pounds of Sugar in 100 lbs. of Juice.....	12.	12.5	12.3	11.9	12.	11.8	10.5	10.2	11.2	12.4	12.3	12.6	13.5	13.7	12.8	13.5
Pounds of Extractable Sugar per ton of Stripped and Topped Cane.....	110.	101.	120.	94.	104.	102.	100.	100	105	112	123	100	109	120	114	116
Pounds of Extractable Sugar per acre of Stripped and Topped Cane.....	1141.	1060	1248	762	1011	975	1037	1238	1269	1096	1189.	766	788	1068	1245	1281
Co-efficient of Purity of Juice.....	69.6	72	73	70	74	69	65	66	70	71	72	73	76	77	73	75
Pounds of Clean Seed per acre.....	1095	620	785	370	330	510	320	490	295	290	290	500	670	470	680	790

The results of these experiments are all modified and made in most respects worthless by the obviously different effects of drought on different parts of the same field.

The spring-plowed ground produced a little more sorghum than that which was fall-plowed. But the difference was not very marked, and the former may have had the advantage in growing on the lower slope of the rising ground.

The extractable sugar, though varying on the different plots, runs up as high as 1,200 pounds per acre; the weight of the stripped and topped cane as high as twelve and one-half tons per acre, and the seed to near twenty bushels per acre.

The different fertilizers were applied in order to determine the effect upon the quantity of cane and seed, and the quantity, richness and purity of the juice, but they are unsatisfactory for the lack of seasonable rains.

A much fuller account of these experiments will be found in the annual report of the New Jersey Agricultural Experiment Station for 1882.

Note on the fertilizers used in the field experiments—Nitrogen, phosphoric acid and potash are essential and expensive elements in commercial fertilizers. The amount of each of these as used in the different fertilizers applied in our experiments is as follows:

		Nitrogen.	Available Phosphoric Acid.	Potash.
		Pounds.	Pounds.	Pounds.
350 pounds	Superphosphate contains.....	.....	52½	.....
150 "	Nitrate of Soda "	22½	.....	.....
150 "	Muriate of Potash " .....	.....	.....	75
{ 150 "	Nitrate of Soda..... } contains....	22½	52½	.....
{ 350 "	Superphosphate..... } .....	.....	52½	75
{ 150 "	Muriate of Potash... } contains....	.....	.....	75
{ 350 "	Superphosphate..... } .....	.....	.....	75
{ 150 "	Nitrate of Soda..... } contains....	22½	.....	75
{ 150 "	Muriate of Potash... } .....	.....	.....	75
{ 350 "	Superphosphate..... } contains....	22½	52½	75
{ 150 "	Nitrate of Soda..... } .....	.....	.....	75
{ 150 "	Muriate of Potash... } contains....	22½	52½	75
20 two-horse loads	barnyard manure contains..	204	164	200
200 pounds	Sulphate of Potash contains.....	.....	.....	80
{ 350 "	Superphosphate..... } contains....	.....	52½	80
{ 200 "	Sulphate of Potash... } .....	.....	.....	80
{ 150 "	Nitrate of Soda..... } contains....	22½	.....	80
{ 200 "	Sulphate of Potash... } .....	.....	.....	80
{ 350 "	Superphosphate..... } contains....	22½	52½	80
{ 150 "	Nitrate of Soda..... } .....	.....	.....	80
{ 200 "	Sulphate of Potash... } contains....	22½	105	80
{ 700 "	Superphosphate..... } .....	.....	.....	80
{ 150 "	Nitrate of Soda..... } contains....	22½	105	80
{ 200 "	Sulphate of Potash... } .....	.....	.....	80

New varieties of Wheat—Three varieties of wheat received from the Department of Agriculture were tested. They were named Champion Amber, Spark's Swamp and Finley. They were sown on plots of thirty square rods each, and were manured at the rate of 300 pounds of ammoniated superphosphate per acre. The Champion Amber looked better than either of the others, larger and broader leaves and taller stems. The Finley had precisely the appearance of Fultz wheat, and it is presumed to be the same.

The following is their yield per plot and per acre :

	Pounds.	Pounds per acre.	Bushels per acre.
Champion Amber.....	335	1,786	29.7
Spark's Swamp.....	350	1,867	31.1
Finley.....	402	2,144	35.7

The times of ripening are the same as that of our common Fultz wheat, and there is nothing either in their growth or quality which is at all superior to the kind we are now cultivating.

GREEN FODDER CORN ; DRIED FODDER CORN ; ENSILAGE.

Two very important questions are considered in the following experiments: First, is the loss of food by fermentation, when green fodder corn is dried in stacks, greater or less than when it is preserved in a silo? Second, is ensilage more valuable for milk production than dried fodder corn?

To study these questions, an experiment was begun on the College farm on the first of September, 1881. At that time the corn was in the milk, the stalks were very rich in cane sugar, and all conditions, apparently, were favorable for the trial.

The amount of available green fodder corn, by actual weight, was ten tons. Of this, one-half was arranged in the field in fifty small stacks; while the other half, after it had been cut by horse-power into lengths of three-sixteenths of an inch, was closely packed in a silo of about twelve tons capacity. The analysis of a sample taken with the utmost care to represent the entire quantity used in this experiment, gives the chemical composition of the corn before it was affected either by loss of moisture or by fermentation.

About the last of November, after an exposure to the weather of nearly three months, 1,200 pounds of the dried stalks were passed through a *Lion Cutter and Crusher*, then thoroughly mixed and sampled. The analysis of this sample compared with that of the original green corn shows the changes which occurred during the process of field curing.

On the 23d of December the contents of the silo were found to be in an excellent state of preservation. A sample taken eighteen inches from the surface was entirely free from disagreeable smell, insipid to the taste, and, as shown by the analysis, equal in all respects to the best ensilage which has yet been received at this Station. The chemical composition of these three samples can be seen in the following table. It should be remembered that sample No. I. represents the green corn, while samples Nos. II. and III. represent fodders obtained from this corn by two different methods of preservation.

TABLE NO. I.

	No. I. Green Stalks	No. II. Dried Stalks.	No. III. Ensilage.
Water	75.00	39.37	74.70
Ash	1.58	4.63	1.95
Proteins	1.25	3.84	1.75
Fat .....	.22	.66	.27
Fiber	6.35	18.65	7.86
Carbohydrates.....	15.60	32.85	13.47
	100.00	100.00	100.00

On account of the different amounts of water in these samples, their relative compositions are not plainly seen. Comparisons between them can be easier made by arranging the results in another table, in which the composition of 100 pounds of the dry matter of each sample is given. Table No. II. is computed for this purpose.

TABLE NO. II.

	No. I. Green Stalks.	No. II. Dried Stalks.	No. III. Ensilage.
Ash.....	6.32	7.64	7.71
Proteins	5.00	6.33	6.92
Fat .....	.88	1.09	1.06
Fiber	25.40	30.76	31.07
Carbohydrates.....	62.40	54.18	53.24
	100.00	100.00	100.00

The ash of corn stalks is that portion which cannot be destroyed by fire. It is not in the least affected by fermentation, nor is it probable that its total amount was in any way changed either after the corn was packed away in the silo or after it was stacked. It is therefore adopted as a standard in comparing the above analyses.

It has been shown that one hundred pounds of the green corn contained seventy-five pounds of water; four hundred pounds therefore of this corn would have yielded one hundred pounds of dry matter containing 6.32 pounds of ash. The question now is, *what is the weight of dry matter in the ensilage and in the field-cured stalks, which*

contains 6.32 pounds of ash? A simple calculation from the figures in table No. II. gives the following results:

TABLE NO. III.

	No. I. Green Stalks.	No. II. Dried Stalks.	No. III. Ensilage.
Ash	6.32	6.32	6.32
Proteine	5.00	5.24	5.67
Fat .....	.88	.90	.86
Fiber	25.40	25.44	25.49
Carbohydrates.....	62.40	44.82	43.64
Total weight dry matter.....	100.00 lbs	82.72 lbs.	81.98 lbs.

Eighty-two pounds of the dry matter of the ensilage and eighty-two and three-quarters pounds of the dry matter of the field-cured stalks now contain the same weight of ash which one hundred pounds of the dry matter of the green corn contained. *During the process of field-curing, therefore, four hundred pounds of green corn lost seventeen and one-quarter pounds of dry matter; while four hundred pounds of green corn packed in a silo lost eighteen pounds of dry matter.* Table No. III. shows further that neither the field-cured corn nor the ensilage suffered a loss of proteine, fat or fiber, but that the total loss fell upon the class carbohydrates, which includes sugar, starch, etc., the least costly ingredients of fodders.

Admitting now that quite as much of the dry matter of green corn was preserved, *in this experiment*, by field curing as by packing in a silo, there remains still several important questions to be considered. First, will cows eat the dried corn fodder as readily and with as little waste as they will eat ensilage? Second, how does the milk of cows which are fed dried fodder corn compare in quantity and quality with the milk of the same cows when ensilage is used?

A feeding trial was begun on the 6th day of December, for the purpose of studying these questions. Four cows were selected from the herd, placed side by side, fed, watered and exercised at the same time, and for sixty consecutive days treated in all respects as nearly alike as was possible.

During the first period of twenty days, all four cows were fed the same daily ration, made up for each 1,000 pounds of live weight of

	Fat.	Proteine.	Carbohydrates.
20 lbs. of Dried Fodder Corn, containing..	.10 lbs.	.57 lbs.	7.08 lbs.
3 lbs. Winter Wheat Bran, containing.....	.10 lbs.	.40 lbs.	1.38 lbs.
30 lbs. Brewers' Grains, containing.....	.40 lbs.	1.58 lbs.	3.00 lbs.
Total Digestible Food.....	.60 lbs.	2.55 lbs.	11.46 lbs.

The digestibility of the dried corn is here assumed to be the same as green corn.

During the second period of twenty days, the daily ration for two of the cows was the same as during the first period; the other two were fed ensilage instead of dried fodder corn. For each 1,000 pounds of live weight this second ration was—

	Fat.	Proteine.	Carbohydrates.
50 lbs. of Ensilage, containing.....	.10 lbs.	.64 lbs.	7.34 lbs.
3 lbs. Winter Wheat Bran, containing.....	.10 lbs.	.40 lbs.	1.38 lbs.
30 lbs. Brewers' Grains, containing.....	.40 lbs.	1.58 lbs.	3.00 lbs.
Total Digestible Food.....	.60 lbs.	2.62 lbs.	11.72 lbs.

The digestibility of the ensilage is here assumed to be the same as green corn.

This ensilage ration was fed to all four cows during the third period of twenty days.

The dried fodder corn, as stated above, was cut and crushed in a machine which leaves it in such a condition that cows can eat it easily. After the first day or two in the first period, the dried corn ration was eaten without waste. During the second period one of the cows seemed unable to eat all of the harder pieces of ensilage; the amount wasted, however, was regarded as too small to be taken into account. *The facts therefore seem to show, that dried fodder corn when cut and crushed is eaten quite as readily and with as little waste as ensilage.*

During the entire experiment the cows were milked twice daily, at 4 A. M. and 4 P. M. The milk of each cow was weighed separately and its weight at once recorded.

Analyses of the milk were made on five consecutive days in each period. For this purpose sample No. I. represented the total daily yield of cows I. and II., while sample No. II. represented that of

cows III. and IV. Results obtained when the cows were fed ensilage are for the sake of comparison printed in heavy type.

	NUMBER OF EACH COW.			
	I.	II.	III.	IV.
Calved.....	Nov. 14, 1881..	Nov. 23, 1881..	Aug. 1, 1881...	Aug. 1, 1881...
Served.....	Jan. 27, 1882..	Jan. 7, 1882....	Sept. 18, 1881..	Oct. 1, 1881....
Yield of Milk during first period.....	624 lbs.	540 lbs.	339 lbs.	350 lbs.
Yield of Milk during second period.....	624 lbs.	526 lbs.	340 lbs.	401 lbs.
Yield of Milk during third period.....	579 lbs.	500 lbs.	300 lbs.	386 lbs.
Total yield of each cow for 60 days....	1827 lbs.	1566 lbs.	979 lbs.	1137 lbs.

In the following tables, cows I. and II., from herd No. I., cows III. and IV., herd No. II. The analytical results given below are *averages*, drawn from the daily determinations of the milk of five consecutive days in each period.

	Herd No. I.					Herd No. II.				
	Specific Gravity.	Total Solids.	Butter.	Proteine.	Sugar and Ash.	Specific Gravity.	Total Solids.	Butter.	Proteine.	Sugar and Ash.
First period.....	10340	13.55	4.27	3.31	5.87	10340	13.87	4.27	3.43	6.17
Second period.....	10327	13.55	4.49	3.11	5.95	10343	14.01	4.42	3.41	6.13
Third period.....	10330	13.87	4.58	3.20	6.09	10346	14.51	4.53	3.59	6.39

As cows advance in their periods of lactation, the per cent. of solid matter in their milk gradually increases; while the yield of milk as is well known decreases. A second table is therefore given, in which the absolute amounts of butter, proteine, etc., yielded by each herd during each period are compared.

	Total Solids.		Butter.		Proteine.		Sugar and Ash.	
	Herd I.	Herd II.	Herd I.	Herd II.	Herd I.	Herd II.	Herd I.	Herd II.
	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.
Total Weight Yielded during 1st period..	157.7	95.5	49.7	29.4	38.5	23.6	68.3	42.5
Total Weight Yielded during 2d period..	155.8	103.8	51.6	32.7	35.8	25.2	68.4	45.8
Total Weight Yielded during 3d period..	149.6	99.5	49.4	31.0	34.2	24.6	65.7	43.8

A summary of the facts shown in the above experiment is as follows :

First—When the green corn was dried in stacks the loss of food was less than it was when the corn was packed in a silo.

Second—When dried corn fodder was cut and crushed it was eaten by the cows under experiment quite as readily and with as little waste as ensilage.

Third—In three cases, the yield of milk was not increased when ensilage was substituted for dried corn, but in one case ensilage caused an increase of eighty-seven pounds of milk in forty days.

Fourth—In the mixed milk for twenty days of herd No. I., ensilage caused no increase the yield of total solid matter; while in the milk of herd No. II. for the same period it caused a gain of eight and one-third pounds, or seven per cent.

FEEDING EXPERIMENTS WITH SORGHUM SEED.

1. It is claimed that on land where corn does not pay expenses, sorghum yields well, its roots finding food in the subsoil.

2. The fact that it is a deep-rooting plant enables it to stand quite a severe drought without serious injury.

3. Some of the late maturing varieties, as the *Orange*, furnish abundant green fodder until killed by heavy frost.

4. The yield of Amber seed and stalk is about the same as that of Indian corn; *but after the seeds are ripe and hard the stalks are still green, and apparently suitable for ensilage.* This point is especially important. Should sorghum prove suitable for this purpose the same field might be made to yield from ten to fifteen tons of green fodder per acre, with from twenty to thirty bushels of clean seed, equal in

weight to shelled corn, which it approaches closely in feeding value, as will be seen below. An experiment with twenty tons of cut and crushed sorghum is now packed in a silo on the College farm.

Attention has been almost entirely directed to producing heavy crops of cane for sugar making, with little or no regard to seed development. Yields of fifty bushels are indeed on record, but such yields must be considered exceptional, from twenty to thirty bushels per acre being nearer an average.

In chemical composition, sorghum meal is almost identical with corn meal. But in the South and West it is regarded with suspicion; although in both sections men can be found who use it not only for their stock, but also for household purposes. In a recent report by Dr. Weber and Prof. Scovell, of the Illinois Industrial University, it is stated that, owing to *tannin*, which is claimed to be present, sorghum-seed meal will hardly find extensive use as stock feed. On the other hand, Dr. Collier, in the report of the U. S. Department of Agriculture for 1880, publishes his inability to detect *tannin* in the seed, of certain varieties, at least, of sorghum, and believes that the meal will be valuable stock food. He expresses an opinion, however, that *tannin* may exist in the seed hulls. In the feeding experiment reported below, these hulls were almost entirely removed from Amber seed by the threshing machine.

The principal object of this experiment was to note the effect of large quantities of sorghum meal on the health of milch cows. Incidentally it was hoped to gain some idea of its digestibility compared with corn meal.

Three cows, well known as steady milkers, were fed daily a ration made up for each 1,000 pounds of live weight of

	Proteine.	Fat.	Carbohydrates.
20 lbs. of Brewers' Grains.....	1.05 lbs.	.26 lbs.	2.02 lbs.
9 lbs. of <i>Corn Meal</i>.....	.60 lbs.	.31 lbs.	6.00 lbs.
5 lbs. of Field Corn Stalks.....	.13 lbs.	.05 lbs.	2.56 lbs.
5 lbs. of Bran.....	.70 lbs.	.15 lbs.	2.32 lbs.
Total Digestible Food.....	2.48 lbs.	.77 lbs.	12.90 lbs.

The grains, corn meal and bran were moistened and thoroughly mixed, but it was found best to feed the cut and crushed cornstalks dry.

The milk was carefully weighed each day, and chemical analysis of it made on four consecutive days.

At the close of the first period of twenty days sorghum meal was added, little by little, to this ration, and equal weights of corn meal subtracted from it, until at the end of two weeks the ration stood

	Proteine.	Fat.	Carbohydrates.
20 lbs. of Brewers' Grains.....	1.05 lbs.	.26 lbs.	2.02 lbs.
9 lbs. of <i>Sorghum Meal</i>.....	.59 lbs.	.30 lbs.	6.00 lbs.
5 lbs. of Field Corn Stalks.....	.13 lbs.	.05 lbs.	2.56 lbs.
5 lbs. of Bran.....	.70 lbs.	.15 lbs.	2.32 lbs.
	2.47 lbs.	.76 lbs.	12.90 lbs.

During the second period of twenty days the milk was also weighed and analyzed as in the first period. The sorghum ration was eaten without waste, and no change in the health of either of the cows was noticed.

A marked decrease in the *yield* of milk occurred almost immediately when the full sorghum meal ration was fed. But as it could with reason be claimed that this decrease might have taken place had no change whatever been made in the food, it was decided at the close of this second period to put the cows on the corn meal ration again, in order to see whether this would cause an increase, compared with the yield from the sorghum meal. An increase followed the change, and it must be admitted that pound for pound sorghum meal yields less milk than corn meal, the difference amounting to at least seven per cent.

In calculating these rations it was *assumed* that seventy-nine per cent. of the proteine, eighty-five per cent. of the fat and ninety-one per cent. of the carbohydrates of sorghum meal could be considered digestible, these percentages representing the digestibility of corn meal. The fact that sorghum meal decreased the yield of milk seems to indicate that its digestibility is slightly lower than that of corn meal:

The conclusions reached are :

1. Sorghum meal, from Amber seed, freed from hulls and fed as above stated, had no injurious effect on the health of milch cows.

2. It exerted no noticeable influence on either the taste, color or chemical composition of the milk.

3. In digestibility it probably stands slightly below corn meal, for when fed pound for pound the corn meal ration yielded seven per cent. more milk.

The figures on which these conclusions rest are given below.

CONDITION OF COWS.

	I.	II.	III.
Calved	Nov. 14, 1881.	Nov. 23, 1881.	Jan. 24, 1882.
Served	Jan. 27, 1882.	Jan. 7, 1882.	March 13, 1882.
Weight, Feb. 3, 1882.....	930 lbs.	885 lbs.	835 lbs.
Weight, May 5, 1882.....	955 lbs.	975 lbs.	925 lbs.

AVERAGE DAILY YIELD OF MILK.

	I.	II.	III.
Corn Meal Ration, Feb. 22—March 13.....	28.6 lbs.	24.9 lbs.	30.9 lbs.
Sorghum Meal Ration, March 27—April 16.....	24.2 lbs.	22.3 lbs.	28.6 lbs.
Corn Meal Ration, April 21—30.....	25.8 lbs.	23.9 lbs.	31.4 lbs.

CHEMICAL COMPOSITION OF THE MILK.

	AVERAGE OF FOUR DETERMINATIONS.				
	Specific Gravity.	Total Solid Matter.	Butter.	Proteine.	Sugar and Ash.
From Corn Meal Ration.....	1.0344	13.88	4.16	3.65	6.08
From Sorghum Meal Ration.....	1.0348	14.12	4.29	3.66	6.18

ADDRESS.

BY HON. JAMES POLLOCK, OF PHILADELPHIA, PA.

Gentlemen of the New Jersey State Board of Agriculture:

My feelings on this occasion are well expressed in an oft-repeated historical incident. Wandering in the magnificent palace of Versailles, the Doge of Genoa was asked by Louis XIV., of France, what, amid all the magnificence and splendor that surrounded him, most excited his wonder and admiration. His reply was: "I admire the beauty and grandeur that I see around me; everything is full of refined elegance—brilliant and wonderful in design and execution; but my greatest wonder is to find myself here." Standing in the presence of such an audience now before me; gentlemen of experience and intelligence; versed in the art and mysteries of agriculture and all that pertains to that honored industry in its various processes and results, like the Doge, it is both a wonder and surprise to me, a novice in practical agriculture, "to find myself here." But the responsibility is not mine. I did not seek this honor. My friend, and your honored President, Mr. Dudley, must bear the burden of your disappointment if I fail to interest you, and do not produce such fruits and flowers of rhetoric as you appreciate and enjoy. He would not heed my remonstrances, the modest intimation of my unfitness for the duty. Oh, no! I must come. I yielded. He rules well here. His kindness and courtesy conquer all opposition.

And now, gentlemen, if the seed I plant at this time will not produce "the full corn in the ear," such as I see on the tables before me, I hope it will not "bring forth briars and thorns."

Although not a practical farmer (yet the son of a farmer), my interest in agriculture, in all its departments, has been deep and is unabated. In public and private life I have advocated the interests of the farmer and his rights. Your President, in introducing me

this evening, did in complimentary terms state my appreciation of agriculture and my efforts for its advancement. I thank him for his words of kindness.

Agriculture in its detail and aggregation is the grand factor of individual and national wealth—the substratum of a nation's power—prosperity and progress. The first of the world's industries, it is the greatest in its results; moral and physical development, manufactures, commerce, science and industrial art, and art in its highest forms, and all attendant associations, are dependent upon it. Its position is one of honor and independence. The labor of the farmer, directed by intelligence and assisted by energy and “pluck,” is richly rewarded. His gains are honest; his dollars have the ring of the true metal. It has been well and truly said, that “the money made by farming is the cleanest, best money in the world. It is made in accordance with God's first law, under honest and genial influences, away from the taint of trade or the fierce heat of speculation. It fills the pockets of the farmer at the expense of no other man. His gain is no man's loss; but the more he makes the better for the world at large. Prosperous farmers make a prosperous people. Whatever benefits our agriculture, benefits the commonwealth.” If all this is true—as it surely is—of agriculture, its benefits and results, how shall its productiveness, its power and influence, be extended? This is one of the leading questions of the hour. You have answered it here to-day. Your society, in its organization and objects, its intelligent discussion, the exhibition of the products of your fields, your reports on the numerous and varied subjects connected with the farm, soil, fertilizers, crops, fruit trees, forests, cattle, horses, beasts, birds, fishes, the mode and method of treatment of animals and their diseases, and all the multiform conditions of agriculture, all these have answered it most significantly and impressively. Yes; organization is a power, and promotes true progress, the concentration of influence, the guarantee of success. In wisdom agricultural societies have been everywhere organized—national, State and county—embracing the intelligent farmer, his scientific friend, the merchant, the mechanic and all the earnest advocates of productive industry. In them, home, home life and home industries are represented and appreciated.

Your Society, in its importance and influence to and on the industries of your State, deserves every encouragement. It receives and gives information on all questions of interest to the farmer, tells him of the

soil, its qualities, its needs, the seeds to be sown or planted, when and how the fertilizers are to be used, of his cattle, horses, cows, swine, poultry, and their breed, and how to multiply their productiveness. The statements contained in the reports of your "Statistical Bureau" are full of information and encouragement to the farmer. Statistics speak well for New Jersey. A few days ago I saw in one of our daily newspapers an article headed "Prosperous Jersey"—figures taken from the "Report of your Bureau of Statistics." As I expected to be here on this occasion, I read it with much interest and satisfaction. Permit me to read some of its statements to you as proof of present prosperity and inducement to greater effort. The report shows the average annual earnings of 50,000 "wage-receivers" throughout the State. The report also shows that in 1880 there were 7,167 establishments whose total capital was \$112,421,593, employing 87,145 persons, whose wages aggregate \$46,403,045. The total value of products was \$255,925,236.

The leading industries are as follows (the first column of figures shows the number of establishments of each, the second gives capital employed, and the third the value of the products):

Silk and silk goods.....	106	\$6,952,325	\$17,122,230
Iron and steel.....	40	9,099,050	10,341,896
Sugar and molasses.....	4	2,110,000	22,841,258
Meat-packing, &c.....	31	1,775,200	20,719,640
Foundry and machine shops.....	188	7,431,421	11,232,748
Flour and grist mill products.....	481	3,879,083	8,459,944
Cotton and cotton goods.....	24	3,961,145	5,039,519
Drugs and chemicals.....	41	3,830,750	4,993,965
Malt liquors.....	49	3,260,800	4,532,733
Jewelry.....	68	2,555,899	4,079,677
Woolen goods.....	27	2,530,125	4,984,007

Other important facts relating to your "iron ore mining and furnaces," your "paper mills and their products," and other industries, are set forth in the report and approvingly mentioned. A moderate estimate of the products of New Jersey for the past year (1882)—agricultural, mineral, mechanical, the raw material and the manufactured articles—would exhibit a value of from *six hundred to eight hundred million dollars*. A grand result: labor, triumphant; industry, rewarded.

Among the items of the report there is one of peculiar interest—"silk and silk goods;" 106 establishments; capital, nearly \$7,000,000;

value of products over \$17,000,000; and this in 1880. And now, in 1883, the past as a prediction for the future, the value of the products of the silk industry of your State will not be less than twenty, perhaps twenty-five million dollars in value. Nor this alone. It is not only a growing industry, but will, in less than two decades, equal in the value of its products some (if not all) of our larger and boasted industries, cotton, iron or wool. Our soil and climate are well adapted to silk culture—the raising of the *Morus Multicaulus*, Osage orange, and trees whose leaves are used for feeding the silk worms. Why should New Jersey import \$12,000,000 of raw silk to produce her \$17,000,000 of manufactured silk, when, with every facility at her doors, mulberry leaves in abundance, the eggs of the silk worm, equal to any demand, easily obtained, the boys and girls of your homes to feed the worms, reel the cocoons and prepare the raw silk for the manufactory? It can be and should be done on our own soil—in our own homes. The poor, the crippled, the children of parents who find the support of the family a hopeless toil, could do the required work with ease and profit to themselves, aid their parents and bring joy to the household. Let your association encourage this enterprise, multiply your silk manufactories, emulate the city of Paterson and her mills, and in this way, and through your numerous industries, make your State indeed “Prosperous Jersey.”

The regular and annual meetings of the “agricultural societies” of the State and nation, are not only profitable to the great interests represented, but tend to the cultivation of the social principle, the development of the genial nature of the friends we meet, and the outflow of that good humor and joke that cheers and brightens our busy lives. I remember, whilst Governor of Pennsylvania, the “United States Agricultural Society” held its annual meeting in Philadelphia, in what is now the “Park.” Representatives from almost all the States of the Union were present—honored men—representative men of every art, profession and industry were there. Among the number a gentleman from that city—a profound lawyer, an able statesman, a dignified and honored citizen, yet social and full of quiet humor. A banquet in the exhibition building was provided by the society on a certain day during the meeting. Many guests were present, among them my genial friend. All enjoyed the good things provided for them. Eating over, toasts and speeches were in order. The President, in regular order, announced a “toast” and called upon our

prominent friend to respond. He arose with grace and dignity—was warmly received. He spoke eloquently and well. Then referring to the many articles on exhibition, works of art, manufactures, cattle, horses and other things, turning to the President he assumed the appearance of grave earnestness, and said: “After all this examination, pleased and entertained with what I saw, I came to the place where the swine were on exhibition. In size, quality and number, they exceeded any similar exhibition I had ever witnessed. I examined them carefully, minutely—yes, Mr. President, every part and portion of them—discovering new conditions and peculiarities in these useful animals; wonderful to me, exciting my curiosity, as they would have excited yours.” Continuing in this strain, grave and serious in appearance, the audience became deeply interested. A profound silence reigned, and all awaited anxiously the conclusion. “Yes, Mr. President, astonished and impressed by my discovery, I cannot, I dare not conceal it longer from this anxious, waiting audience. It was this, Mr. President, that among the entire number of swine on exhibition, and they were many, after close scrutiny and examination, I made this important discovery, *that no two tails curled alike.*” The spell was broken. Laughter and uproar succeeded the silence and gravity of the audience. He was applauded to the echo.

All this proved the poetic aphorism of Hudibras: “A little nonsense now and then, is relished by the best of men.” Also that fun and farming are not incompatible.

Again, whilst organizations are valuable in aiding the progress of agriculture, we must not forget that all the forces of nature are ever present in air and ocean, river and rill, mountain and mine, forest and field, to aid and crown with success man’s daily toil—the industry that secures prosperity. The sunbeam, falling upon the earth in silence, is almost omnipotent in its power and influence—the farmer’s best friend and helper, as he turns the sod and sows the seed, awaiting the return of his labor in abundant harvest and the rich fruits of the earth. The sunbeam, chemists and astronomers tell us, is a union of three elements of power—a combination of three distinct species of rays—luminous, giving us light; heating, or warm rays, and actomic, or chemical force, affecting the chemical combination of substances. These rays, singly or conjointly, influence all created substances; no substance, organic or inorganic, simple or compound, can be exposed to the rays of the sun without undergoing a chemical or mechanical

change, or both. How great the effect of the sunlight upon the atmosphere! Light, heat, rain, winds, storms and all the aerial and constantly recurring phenomena of nature; also the effect upon the ocean, warming its whole expanse, creating the currents and streams which change and modify the temperature of the whole globe. Every drop of rain is the product of the sunlight. Lifted by evaporation from earth and ocean to the cloudy chariots of the sky, carried by the wind through space and condensed by the colder currents of the air, they drop upon the mountains and the valleys, the wilderness and the ocean, turning "the wilderness into standing water" and "the dry ground into water-springs."

All the vital functions of vegetation are sustained by it. By its aid plants *breathe*, part with their oxygen and take in carbon; it colors their leaves, gives beauty and fragrance to the flowers and flavor to the fruits. The existence and growth of every tree, plant or blade of grass are dependent upon the varied influence of the sun's rays. Every living thing that hath breath, all metals, minerals, mineral solutions, phosphates, gases in all their variety, crystallization and all chemical phenomena acknowledge its power and bow to its influence. Such the wondrous force and mission of the sun. "There is nothing hid from the heat thereof." Let us with reverence ever say of Him, who maketh the outgoings of the morning and evening to rejoice, "Thou crownest the year with thy goodness and thy paths drop fatness; they drop upon the pastures of the wilderness, and the little hills rejoice on every side. The pastures are clothed with flocks; the valleys are covered over with corn; they shout for joy; they also sing."

In agriculture, as in every department of life, "knowledge is power," and the progression of knowledge an incentive to its acquisition. The unknown becomes the passion of him who desires to know. Education is the handmaid of knowledge. It is development in the direction of success in labor, art and science. It elevates the mind, as labor elevates the character. Educated labor strengthens both mind and character, and makes and marks true manhood. Instruction is the universal instrument of labor; useful in all the departments of industry, mental or physical.

Every age of the world has its characteristics, marked by the ideas men entertained of themselves and their relations to each other; to law and government, to freedom and slavery—the recognition of the

rights of men or their denial and overthrow. The past, the present and the future prove and will prove the influence of education in forming and maintaining individual, social and national character, and advancing the great industries of the world.

The historical and educational epochs of the ages are full of interest to the student, and teach lessons of practical wisdom to all in every rank and condition of life. "History is philosophy, teaching by example," and it does teach that education, intelligence and the recognition and enjoyment of human rights and privileges are grand factors in the success of agriculture and all other industries. Without them, there is no advance, but all are stationary or retrograde. Oriental civilization, with its characteristics, is proof of this. Man, in his relations to the government, was regarded "as the child of the patriarch and the slave of the despot." No rights; but gross oppression. The education of the age was of the "imagination and speculative intellect." Nothing practical or real. Barren and waste her fields. No agriculture or productions as the result of the cultivation of the soil. The camel, the ox, the horse, the ass and sheep constituted their property—their chattels, their wealth. The Arab of the desert represents their civilization. Greece and Rome, in their historical and educational epochs, indicate a change, but little improvement. "Man as a *citizen*, but the *property* of the State" was the rule. No political rights; his only claim upon the State was protection as a citizen. Their education was of the "practical intellect and the will." Art in sculpture, painting, poetry and architecture, wars and conquests the great business of the age. Agriculture neglected and labor despised.

The middle ages and modern Europe, in their educational civilization, mark a greater progress; a clearer recognition of the relations of man to the State; and may thus be expressed—"Man and the State"—man equal to the State, but not its maker or controller—the State his ruler and defender—no longer the tyrant and oppressor.

The education of the religious sentiments, commencing with the dawning of Christianity, and developed by the reformation, marks this epoch of the world's history. The darkness of the middle and earlier ages was broken, the light of truth began to shine, humanity asserted its rights, mind realized its power, invention began its noble work; and soon the printing press, the mariners' compass, and other discoveries attested the progress of the age. Agriculture, commerce and the industrial arts felt the magic of its power, and moved forward

to other and greater conquests. Education and agriculture! how intimate the relation; and when acting and re-acting on each other, how sure the progress of both!

At last, we reach our American epoch, now in progress and full development. It is not now "Man and the State," but "Man personally free and master of the State." He makes and unmakes his rulers; acknowledges no political ruler but those of his own choice; no law but the will of a free and sovereign people, as embodied in our simple forms of constitutional law and order. Freedom and intelligence cannot safely be separated. They are dependent upon each other and essential to improvement and progress in every art, industry and profession.

The American epoch is distinguished by education in the physical sciences and inventive arts, teaching man the uses of nature and how to control her forces. Education now asserts its power; our free institutions afford every facility for the acquisition of knowledge; the fields for enterprise and achievement are free and open to all who have the courage to attempt and the energy to persevere. Education for all, everywhere and in all conditions of life, is the want and demand of the age—the true principle and power of progress.

The peculiar character of our country and its institutions offer to all our people the highest and noblest incentives to honorable exertion—to the cultivation of those virtues that adorn and dignify the man and the citizen. Here no privileged few claim superiority or pre-eminence over the many. No royal blood. No aristocratic titles dispute the sovereignty of "we the people," or deny the equality of political rights that makes all equal. We recognize no aristocracy but the aristocracy of *moral* worth; no nobility but that which belongs to God's noblest work, "*an honest man.*"

Here, more than in any other land, each one is the architect of his own fortune, the maker and guardian of his own good name and fame. Its offices and honors are open to all, inciting to generous emulation, cheering the humble, encouraging the timid, and inviting all to become competitors for the prize of a true and honorable fame.

There is what may not inaptly be called or termed a professional mania abroad in our land, an over-weening desire among our young men to enter some one of the so-called learned professions, regarding them as the only sure road to wealth, honor and political preferment; turning away from honorable industry and the mechanic and agricultural arts,

as if these unfitted man for the higher duties of the scholar and the statesman. This is an error; it is worse than a mistake. Whatever of social or political position and influence the professions conferred in days gone by, their prestige is now almost gone—their charm is broken. The reason is obvious. They are now crowded to overflowing; the supply, such as it is, largely exceeds the demand; impudent assurance and presumptuous ignorance attempt to usurp the place of real merit. Professional quackery assumes the garb, and is too often mistaken for professional learning, and thousands who have entered them find that they have mistaken their vocation, and that their dreams of wealth and greatness have not and will not be realized. As the result of all this the standard of professional talent has been lowered, its influence weakened, and the professions themselves endangered.

Let me not be understood as disparaging the professions. They are useful, honorable and indispensable. But they have been injured by the many, who, mistaking the dictates of vanity for a consciousness of vocation, have, unprepared and unfitted for the place, crowded into them.

We cannot spare all our educated young men for the professions. We need them elsewhere—in places equally honorable—equally influential. We need educated professional *labor*, and we need them to sustain the dignity of labor—to elevate and honor industry in its various departments; in a word, to place the agricultural and mechanic arts side by side with the professions in social position and public esteem. It can be done without the loss of dignity, character or influence. A sickly sentimentalism, a prudish refinement, or a brainless upstartism may object and call it vulgar, but truth, virtue and wise manhood will approve; and what the world's Redeemer has honored let no man despise.

We are not without examples in our own land of men who have graced with equal honor the counting room and the senate chamber, the workshop and the study, the field, the plow and the chair of State; who with brawny arm have made the anvil ring, and with the productions of a giant intellect startled the world and made it ring with their praises.

Such examples speak with wondrous force. Let them be imitated. Let science and labor be united. In union both are honored and honor each other. Labor is honorable; fear not to touch its hard hand. Labor is virtuous, honest, true; dread not its society or associ-

ation. Science speaks to labor as it turns the furrow in the field; and both, with art, rejoice in the rich fruits and beauteous flowers of earth.

Science in union with *art*, aided by the brawny arm and willing heart of labor, has gone forth conquering and to conquer. The philosopher and the artist are dependent upon each other, and both upon labor. Labor standing between, tenders to both her mighty energies, and by its aid their most brilliant achievements have been performed.

What I desire to do, is to impress upon you and all the friends of the field and farm, the necessity of education. Educated labor—the muscle and the brain in union—will aid your advance and keep you abreast of the times in every forward movement. The day to sneer at “book farming” is past. Why should not the farmer be educated? Why not be taught in the arts and sciences, especially in those sciences that are so closely allied to and which can so greatly aid agriculture? Why not make his vocation a profession, respected and honored, equal in importance and dignity to any of the professions? Science and art, in this age of progress, are the friends of the farmer, his aids and advisers, and they should be studied and cultivated. Astronomy, geology, natural philosophy, botany, electricity, electro-magnetism, and chemistry are all his instructors and willing assistants. Civil and mining engineering, and the mechanic arts, in addition to the sciences, have given a new impetus to agriculture, horticulture, arboriculture, mining, and all the great industries that add their rich products to our already abundant stores.

Modern invention has given us the steamship, the railroad, the locomotive, the telegraph, telephone, all the companion friends of the farmer and his honored work—the inspiration and prophecy of other grand achievements. The locomotive, in its plan, purpose and machinery, what is it? So much wood and iron arranged in systematic order. Yes; but more than this, it is mind embodied in matter, thought revealed in machinery; mind the power, education, art, mechanism, the instruments; the locomotive, the result and the triumph of thought.

How numerous and useful the inventions of the past half century! The world moves. To move is the rule; to stand still the ignoble exception. The *telegraph*, too! It was my privilege, whilst a member of Congress, to be present when the first telegram on the first line then completed, was received in one of the rooms of the capitol in

Washington, in May, 1844. The line was from Baltimore to Washington, the terminus being in one of rooms of the capitol. I heard the first click, heard the first message read ; it was this : " What has God wrought." Wonderful ! All were astonished ; some doubted. *Forty miles then ;* now eight hundred thousand. Then on land forty miles ; now on land and sea, through ocean depths, around the world. Yes, farmer ; without your aid, your provision and supply, all this would as yet be among the unknown ; and all this re-acts, and now comes to your aid to advance your prosperity and, through you, the happiness of mankind.

Agricultural chemistry should be carefully studied and applied. It is of great value to the farmer. By it he determines the quality of the soil, its component parts, its needs, the food or fertilizers required, the nature and use of phosphates, alkalies, lime, the various gases, the seed or grain best adapted to the soil, how to improve seed and plants by crossing, the proper preparation of manures and their use—all these and many more useful services chemistry furnishes to the farmer.

I am more than gratified to know that you have in your State " Experimental Stations," under State patronage and supported, in part at least, by State appropriations. The value of these schools of agriculture cannot be overestimated. I am pleased to know, also, that these " Experimental Stations" are under the direction and control of educated professional gentlemen and scholars, whose skill and scientific knowledge, their chemical experience and enthusiasm in prosecuting scientific research—the object for which these " stations" were established—warrant and will secure their success. Their experiments on the soil, seed, crops, minerals, and all matters pertaining to agriculture within your State, have been practical and profitable. Encourage them. Let your State encourage them. Heed their advice ; follow their directions and you will thus advance the true interests of agriculture.

Your President, in his address in the afternoon, referred to the destruction of trees and forests. This destruction is one of the great errors, if not wrongs, of the age ; it is immense, and will produce, not only a scarcity of lumber and affect the quality of the soil, but will greatly change the character of the climate, its temperature, inviting storms and tempests, as well as drought, affecting the rain-fall and the salubrity of the air. Trees and plants are the great absorbents of carbon, hydrogen and other injurious gases thrown into the air by

combustion, exhaled breath and the decomposition of animal and vegetable matter, injuring its vitality and affecting its fertilizing properties. By the absorbent power of our forests, plants and vegetables, the atmosphere is relieved of these gases and its purity restored. Save the forests; spare the tree; and not this alone, encourage the planting of fruit and other trees in and around your farms—plant abundantly and they will richly repay you for all your labor. National and State legislation should interpose to prevent the wholesale and wanton destruction of our trees and forests. It cannot be checked too soon. Spare the birds, also; they are your friends.

And, in this connection, it is worth while to inquire what is, and will be, the effect of the numerous iron and steel rails, the telegraph and other wires, upon our climate and the atmosphere; what changes—what electrical and other natural phenomena, in earth and air, will all these produce. These rails and wires now extend from the Atlantic to the Pacific, from the lakes to the gulf, within, around, and all over the continent, all charged with electricity and bearers of this mighty force; this electric energy will be realized in atmospheric changes and other phenomena. How will all this affect the fertility of the soil, the rains and the dew, the heat and cold, the whirlwind and the storm? Let our scientific men consider this problem and give us its solution; it is worthy of careful and intelligent consideration.

The sources of knowledge are said to be observation, analogy and experiment. By observation facts are discovered and noted; by analogy their relations, or similarity, or diversity are ascertained; and by experiment the truth of the analogy, and the nature of the facts themselves determined. Thus, in the progression of knowledge, *observation* guided by *analogy* leads to *experiment*, and *analogy* confirmed by *experiment* becomes a scientific truth. This is true in agriculture as in science, and therefore your own experience and your "Experimental Stations" become useful and valuable in the prosecution of your honored vocation.

A crown of laurel awaits the scholar and scientist who will, while retaining the present, simplify and popularize (without destroying) the nomenclature or terms of art and science, and fit it to the popular mind—the thought of intelligent men not learned in classic literature. Then would your sons in their homes read and understand the great principles of nature and truth that underlie and give efficiency to agriculture and its concomitant industries. Better far this than the

reading of the wretched yellow-covered literature—the dime novel, that make so many young men tramps, vagabonds, thieves and murderers.

And now, gentlemen, I thank you for your earnest attention to my address; and although I have not enlightened you, I hope some of the thoughts and expressions may prove, at least, suggestive and lead to good results.

I also thank you for your warm and generous reception given me on my arrival, for the kind greeting of old friends, the warm shake of the hand, with a heart in it, not the two fingers of the heartless, cold as icicles, and repulsive as chilling.

The government has a duty to perform to and for the farmer. Protection of all his interests and productions by proper and needful legislation. The farmer not only feeds all, but every manufactured article, in every form and shape, useful or ornamental, contains in a large degree the fruits of his labor—labor and the food and material furnished by the farmer, giving to them their greatest value. Protect the farmer and his industries, and thus protect every department of labor, and also by such protection promote national prosperity, so dependent upon labor, upon honorable and productive industry.

We are here on the banks of the Assanpink and the Delaware—places full of historic memories; Washington crossing the Delaware in 1776, in winter's cold, cannot be forgotten. Trenton, Princeton, Monmouth, all associated with battles and victories, stand to-day the honored monuments of New Jersey's patriotism and devotion to freedom and independence, as now embodied in American unity and nationality. To every young man—to all, let me say, stand by the banner of the free! gird on the armor of a noble manhood! And then, with firm step and high resolve, move onward and upward until your work is done—until success complete crowns life with victory; and with patriotism as the inspiration, and the glorious memories of the past around you, offer, as did your forefathers, life and all for your country; and resolve, that this nation in its unity—"this government of the people, by the people, and for the people, shall not perish."

THE GOFFART SYSTEM OF ENSILAGE.

BY J. B. BROWN, NEW YORK.

In the division of the honors of useful discoveries and inventions among the nations of the earth, it would seem that the preservation of green crops by ensilage should have been evolved by some one of the inventive inhabitants of this continent, where the native maize plant provides a grand subject, and the numerous cattle to be provided for, over winter and across dry seasons, furnish an incentive sufficient to invite the attention of the most inventive people on the planet. But we were already agriculturally richer than any other people, and we rested upon our pastures and meadows, and upon our grain and straw, while our inventors brought out the splendid harvesting machinery that is the wonder and the envy of the world. If fodder crops of maize were sown it was for the purpose of supplementing the pastures through a dry autumn, until the proper time arrived for the cows to go dry and the price of butter and milk to advance to a grain-feeding price.

In the meantime, the farmers of Central France had been studying this exotic gigantic grass that would grow so large among them, but without maturing its seed. They found in it a more luxuriant and profitable food than in any of their splendid grasses. They discovered what we do not yet practice, that it should not be fed fresh cut, but should always be piled and heated before feeding. So they cut it some days before feeding, and placing it in small piles, spread over it a blanket, and thus increase the digestibility by what is, perhaps, a commencement of saccharine fermentation.

This process, so profitable while it lasted, was soon terminated by frost, while the humidity of the climate made it difficult to dry the stalks, and this great source of food was early cut off.

In the effort to prolong it many experiments were tried, such as

mixing with dry straw, piling up in stacks or cellars or trenches, more or less salted, and covering with earth to keep the air *out*, only to yield a more or less rotten product after a few weeks of constant deterioration. It was this method that Prof. Caldwell, of Cornell University, claims to have first introduced to America in the New York *Tribune*, eight or nine years ago. A method so useless here, and so ineffective at its birth-place that it gained no considerable extension. From this combination of circumstances arose the necessity which was the mother of the invention. In 1873 the fullness of time had come, and the discovery that is destined to confer a greater benefit upon mankind than any other that has ever been made was born.

At a meeting of the Central Agricultural Society of France, held April 7th, 1875, the Committee on Stock Management and Physico Chemical Sciences made a report, from which I extract :

"A member of our society, Monsieur Auguste Goffart, gentleman farmer of Chateau de Burtin, near Nouan le Fuzelier (Loire et Cher), has communicated to us the advantages of the cultivation of maize for fodder, and the possibility of preserving it green during the greater part of the year. He presented us with a sample, which justifies the preference which he has given to his method. Your committee consider that if the results are as satisfactory as M. Goffart has stated, that they should be made known to the agricultural public."

A special committee was then appointed, which examined the new-born infant in a most thorough manner, employed a chemist to analyze the ensilage, and reported :

"To sum up this report, we have seen at Burtin a preservation of green maize on a large scale, and in a practical manner, which we have not seen described anywhere. We report favorably upon M. Goffart's remarkable success. He has created a system of agriculture in the midst of sterile Sologne which should be held up as an example to more favored countries."

We all know how the "example" was received in this country ; with what cautiousness by the farmers ; with what incredulity by the scientific men ; with what scorn or lukewarmness by the agricultural press. The translation of Goffart's manual, in which the system was fully developed, was published in the winter of 1878-9 ; 2,000 copies were sold and given away. Until 1881 there was only one farmer in

each of the States of Maryland, New Jersey, New York, Maine and Massachusetts, who could speak with the confidence of experience. And when some of these gentlemen began to speak, they spoke so loudly that people were alarmed by their enthusiasm.

It was fortunate for America that there was a class of farmers here with whom farming was a recreation or amusement. It was these men who were the pioneers in this matter. Ensilage is a business man's invention, and it was practical business men here who first appreciated it.

At the Ensilage Congress, held in New York two weeks ago, invitations to which were sent, as far as known, to all the persons who had written about or knew practically anything about ensilage, no one in that room full of farmers could find anything to say against it, though urged to do so repeatedly, and to tell us of their failures; but all of them, millionaires and working farmers, anxiously sought an opportunity to pile up the testimony that this was no common blessing that had befallen the world. One of the most able speakers, in every sense, Le Grand B. Cannon, armed with exact figures, said: "My profit from ensilage, in cost of feeding and in increase of product, over the old way, is fifty-one and a half per cent." This was the result with a herd of ninety short horns. My own experience shows not only a larger percentage of profit, but that the system is adapted to the very smallest farmer. I have two cows on a piece of ground in New York City of four acres. A stony half-acre was covered with drought-killed sod. It cost me \$10 to get that half-acre plowed and harrowed by a neighboring contractor, \$1 more for a half-bushel of the best kind of Southern seed corn. The rest of the work was done by the family horse and the gardener. That crop never saw a drop of rain, and before it made any ears it began to fade; like a consumptive girl, it grew whiter day by day. But the silo was ready. It is made like a bin, single thick, not even matched, second-hand one-inch boards, in the cellar beneath the stable; cost, \$10. It will hold ten tons, but I had only half that amount. Dropped in from above, taken out from below. I was a week, purposely, in ensilaging that small crop; my two boys brought in the mowed stalks to the cutter in hand-carts, and trampled the silo each morning and night. It was cut one inch. It was very hot when the cover and thirty pounds of stones to the square foot were put on, but it cooled off very quickly; in twenty-four hours could feel that boards were cool. Every one is astonished to see how

the cut maize shrinks under pressure, as it gives up its elasticity. The effect upon the milking cow (ten months) was to increase two pounds per day or ten per cent. It saved me two tons of hay, at \$20 per ton. Now you see from this that silos *need not be air-tight*; even the bottom of my silo is on sleepers, so that water could flow under it. Silos need not be filled rapidly. They need not be filled when the plant is full of juice, but as soon as convenient after ripening the juice, or after the pollen has fallen. The fact is, *cut stalks, under pressure, evenly spread, if no water enters, cannot fail to make good ensilage, whether under ground or above ground.*

The French farmers found that you can take out of the silo something that you do not put in; and that is *condition*, or digestibility.

M. Goffart carefully experimented on this matter. He found that sixty-five pounds of good fine cut ensilage was equal in nutritive value to 110 pounds of same maize in whole stalks, fresh from the field. Evaporation cannot account for this, as that is less than two per cent. The silo is something more than a preserver. It ranks with the mill, the charcoal pit, the pot, and the bread bowl. It prepares the food for digestion. It is not properly fermentation, but lactic acidification, which changes the starch and cellulose into saccharine substance, and which makes good ensilage. The operation prolonged, by excess of oxygen it becomes acetic, but it is sour before acetic acid develops. But whatever the changes are that take place in the silo, they increase the alimentary properties of the fodder.

Like the charcoal pit, if too much air is supplied, the product is not coal, but ashes. And if too much air remains in the silo, the ensilage is not so well preserved. As yet, no one knows exactly what is the standard.

M. Goffart says: "The fineness to which I cut my maize is extremely important, in view of good preservation. When cut four-tenths of an inch, the maize packs better in the silo; it occupies less space, and takes the form and consistency of a species of pulp, leaving in its mass the least possible amount of air. In proportion as the length is increased, the preservation becomes less perfect, and is finally very poor indeed. A farmer who copied my silo exactly, and filled it with maize, cut two to two and a half inches, took out a very poorly preserved product."

The necessity of cutting fine doubtless depends upon the size and dryness of the stalks. Small and juicy stalks can be preserved very

well without cutting, but are not so conveniently fed. They can never be run through the cutter so cheaply as when fresh and direct from field.

The better the quality, of course, the more the cattle will eat, and the better it will nourish them. M. Goffart feeds six per cent. of the weight of the animals.

The principal acid in grasses of large growth, such as maize, is phosphoric, and M. Goffart's habit is to spread upon his manure pile, every ten days, half an ounce of phosphate of lime to each cubic foot.

The weight upon the ensilage when well trampled, does not need to be more than thirty pounds to square foot, unless it is to be used quickly. I do not find that the lower strata of ensilage where the pressure is several times as great as at the top is any better than that which is near the top. It is more important to spread it evenly than to weight it heavily. It should be spread constantly as it falls into the silo, else it will be more compact where it falls, and will not settle uniformly. Cord-wood is convenient for weighting.

The object of exposing ensilage to the air before feeding, is to heat it still more by heaping it. Some think that silos should be filled quickly—if possible, in a day—and the silos therefore small. I don't think so, at least as to maize. If the silo has been filled slowly, so as to be heated, the cattle will prefer it directly from the silo. That has been my experience. If your engine breaks down, you need not be alarmed for your crop, but trample and cover it while waiting.

We know that by good management, it can be made to cost very little; by bad management, it may cost very much. One farm superintendent, who came to the Ensilage Congress from New Jersey, reported that it cost \$6.25 per ton, but he included everything. Another precise farmer from Nebraska, using the same kind of machinery, reports ninety-two cents per ton as the cost. By prudence and practice the total cost of maize can be kept under \$2 per ton. At the Havemeyer silos it costs \$3 per ton. Side hill silos are the most cheaply filled.

We know that it does not deteriorate by remaining in the silo. We know that it improves the health and condition of cows and hogs, that it prevents relaxation and abortion; that it increases the vigor of bulls; that it increases the quantity and does not injure the quality of milk or cream, in comparison with any food whatever.

We have learned that the mature stalk can be ensilaged even after

husking, and be better than a totally dried stalk. But the glory of the discovery is, that every farmer is sure of a crop. If drought comes, and the ear does not mature, the precious juice remains to him. He is sure to reap in one form or another, the reward of his labor. By ensilage, he is saved the further labor of husking, shelling and grinding. Safe from fire, from tornadoes, from vermin. He can, with well-preserved ensilage, increase the girth and the yield of all his herd, without any grain whatever.

When I read to the two hundred well-fed farmers at the Ensilage Congress, Prof. Cook's experiments where he says :

"When the green corn was dried in stacks, the loss of food was less than it was when packed in a silo." It touched no answering chord.

It may be that farmers generally know but little of the merits of maize raised for fodder, dried without husking, and before the juices have entirely gone into the grain, or dried out of the leaves; but those who do know about it, practically, and on a large scale, say that in the safety and economy with which the green stalks can be cut and packed in silo, and in the decided preference given to them, as a steady diet, and in the health of the animals, and in yield and quality of milk, and in the fattening power of the food, everything is in favor of the ensilage method.

"I let out my cattle once a day to drink," says a farmer with a silo; "they drink but little, but they play a good deal; my barnyard is a regular circus."

Last week, we read how the cattle in the West were suffering for water, streams frozen solid. They need silos especially in the home of the blizzard.

From New York *Sun*: Dallas, Texas, February 5th, 1883. "The bitter cold which set in throughout Northern Texas last night still continues. The thermometer has been down to zero nearly all the time. The sheep and cattle ranchers fear a great loss to flocks and herds as the ranches are not prepared with proper shelter and fodder for such severe weather."

To feed animals with maize stalks, from which grain has been harvested, whether they be steamed or shredded, or ensilaged, is a waste of digestive power. Better to stand them up on the north side of the yard to keep the wind away, or cut up for bedding, or let the cattle pick up what they choose for amusement, but all the rest had

better go into a manure heap, undigested. Raise a few more fodder stalks, and mix the meal with those.

In the report of proceedings of Ensilage Congress, will be found testimony that ensilage alone, or with less meal than with hay, increases the weight of cows, sheep, oxen and hogs; that horses can work and keep fat on certain kinds of ensilage alone, and that with no other known food as a staple can cattle be so cheaply fattened in the Eastern States.

He has been considered a poor farmer who sold his hay. Now it is the wise farmer who has hay to sell, and who sells it while it brings a good price.

I read to the Ensilage Congress Prof. Lawes' conclusion that "American farmers claim too much for ensilage; that the silo adds nothing to the value of grass or clover, and the process of drying in the production of hay subtracts nothing but water."

The answer was, while we cannot afford to raise grass for ensilage when we can raise even ten tons of green maize to the acre, still we know by experience that cattle will fall off in milk when taken from clover ensilage to best clover pastures in June.

With the system of ensilage introduced throughout the United States, fortunately free from all patents, and important to every State in the Union, the greater facility of taking care of cattle in the winter, that the silo and its labor-saving methods and arrangements promote, will increase the disproportion of farm labor required in winter and summer, making it more expensive when wanted. What are you going to do about that? We don't want to feast the agricultural laborer half the time, and starve him the other half.

I suggest that every farm have also its hot-house for winter employment. Early vegetables, grapes and rosebuds will be found as profitable when the labor is cheap as the more common dairy products! The poultry yard can be increased and ensilage-fed hens are also happy and productive.

For the past two years nature seems to have looked with ill-favor upon silos, and those who would fill them, but if this society should offer a prize of \$500 for ten acres of New Jersey soil that shall yield, the coming season, the largest weight of green stalks, there will be some enormous crops produced. It only requires three pounds to each square foot to make sixty-five tons to the acre.

Kansas exhibited at Philadelphia, in 1876, a bunch of maize stalks

thirty feet high. A tall man with an umbrella could just reach the lowest ear.

In one hundred years, or 1980, according to the previous rate of growth, by which population doubles every twenty-five years, this continent is to contain 800,000,000 of human mouths, or twice the number per acre of its agricultural land that now inhabit France. The corn plant and the silo, in view of this problem, are blessings that are simply inestimable. The unlimited supply and the safe reservoir of food for cattle, which in turn will bridge over the direst dearth of cereal crops.

NEW JERSEY
STATE BOARD OF AGRICULTURE.

MINUTES OF THE ANNUAL MEETING,

Held at Trenton, February 6th and 7th, 1883.

STATE BOARD OF AGRICULTURE.

STATE HOUSE, TRENTON,
February 6th and 7th, 1883. }

The annual meeting of the State Board of Agriculture was held in the State House, at Trenton, on Tuesday and Wednesday, February 6th and 7th. There were present the following members and delegates, besides about one hundred prominent agriculturists representing all parts of the State :

SOCIETY.	DELEGATE.
New Jersey State Grange, P. of H.....	ISAAC W. NICHOLSON.
New Jersey Cranberry Growers' Association.....	E. W. CRANE.
New Jersey State Horticultural Society.....	E. WILLIAMS.
New Jersey State Agricultural College.....	JOHN DE MONT.
New Jersey State Agricultural College.....	ABRAM W. DURYEA.
New Jersey State Agricultural College.....	PROF. GEO. H. COOK.
New Jersey State Experimental Station.....	HON. THOS. H. DUDLEY.
Board of Visitors Geological Survey.....	HON. WM. PARRY.
Atlantic County Board of Agriculture	Z. U. MATTHEWS.
Burlington County Board of Agriculture.....	WM. R. HANCOCK.
Camden County Board of Agriculture.....	EDWARD BURROUGH.
Cumberland County Board of Agriculture.....	MORRIS BACON.
Essex County Board of Agriculture.....	J. H. BALDWIN.
Gloucester County Board of Agriculture.....	CHALKLEY DUELL.
Hunterdon County Agricultural Society.....	F. S. HOLCOMBE.
Mercer County Farmers' Club	HENRY E. HALE.
Monmouth County Agricultural Society.....	JAS. J. CONOVER.
Salem County Agricultural Society.....	OMAR BORTON.
Somerset County Agricultural Society.....	WM. S. POTTER.
Union County Board of Agriculture.....	N. W. PARCELL.
Vineland Agricultural Society.....	PHILIP SNYDER.
Secretary State Board of Agriculture.....	P. T. QUINN.

The meeting was called to order by the Hon. Thos. H. Dudley, President of the Board, and the programme that had been previously arranged by the Executive Committee, was adopted, after being so

amended as to make the "Milk" question the order of business at 2:30 P. M. on Wednesday.

The following report of the Executive Committee was read by Mr. W. S. Taylor, and was accepted and ordered to be spread upon the minutes.*

The President announced the following committees :

Credentials—Edward Burrough, E. Williams, Morris Bacon.

Nomination of Officers—W. R. Hancock, E. W. Crane, Isaac W. Nicholson.

The Hon. George Blight, of Pennsylvania, was then introduced, and, in a brief address, explained the advantages of applying the Guenon method to judging cows, bulls and steers. He said, that to a person who understood it imperfectly, it was of no great advantage, but to any one who would become proficient in applying it, its value was very great. The beauty of the method was that, while it almost invariably indicated the true value of the animal being examined, it in no way conflicted with any other method, but was a help to any and all of them. Is there a farmer who does not desire to know whether a calf is worth raising, or a bull worth keeping, or a steer worth being stalled? If he will acquaint himself with Guenon's method, these things are all made plain. The importance of having bulls that will have such influence as to produce large and rich milking cows is not fully realized. It is not known, generally, that he bears the marks that will indicate his character in this direction; yet, such is the fact, as is known to all who have studied and practiced the Guenon method. So it is, also, in steers, in reference to their tendency to fatten economically.

Mr. Blight said that this method of judging and selecting cattle was first brought to his notice in 1849, by a German, who had but lately arrived in the country; he had carefully studied and applied it ever since, and his experience and practice fully confirmed Guenon's theory, and at least ninety-five per cent. of all the examinations he had ever made had resulted in a victory for the method. He commended it to every one who owned and was buying or raising cows.

Mr. James Neilson, of New Brunswick, stated that Mr. Blight had visited his place and had accurately described all the cows in his herd, picking out the best with great accuracy.

*This report will be found in full in the body of the volume.

REPORTS OF STATE AND COUNTY SOCIETIES.

STATE HORTICULTURAL SOCIETY.

Mr. E. Williams reported an accession of thirty-five members during the year. Its annual meeting had been the best ever held. The society felt in need of aid and support from the State, and believed that horticulture as well as agriculture deserved to be fostered.

WEST JERSEY CATTLE ASSOCIATION.

Mr. W. S. Taylor said the members of this association were nearly all engaged in breeding Jersey cattle. Meetings were held monthly, and every endeavor made to promote the interest in this popular breed. A year ago it had held an exhibition in connection with the Moorestown Agricultural Society, but no exhibition was held this year.

This report drew out an interesting discussion on the merits of different breeds of cattle. Mr. James Neilson, speaking in favor of Holsteins; Mr. Blight, Guernseys; Mr. John Crane, Ayrshires.

ATLANTIC COUNTY BOARD OF AGRICULTURE.

Mr. Z. U. Matthews made a brief report, which will be found in the report of the county societies.

BURLINGTON COUNTY BOARD OF AGRICULTURE.

Mr. Wm. R. Hancock. (See county report.)

BURLINGTON COUNTY AGRICULTURAL SOCIETY.

Mr. Henry I. Budd read a very long and interesting report of crops, in which it was shown that the yield of wheat per acre was one of the largest ever raised in the county, ranging from thirty to forty bushels per acre. The large yield was attributed to the sowing of the Fultz variety of seed, which had added at least ten bushels per acre to the yield. Corn yielded forty bushels per acre; rye, fifteen to twenty; grass and hay, average; fruit, medium; apple, poor.

CAMDEN COUNTY FARMERS' ASSOCIATION.

Mr. E. Burrough read the following :

The operations of this association for the past year have mainly been confined to encouraging individual experiments in the use of fertilizers, seeds, planting and cattle feeding. Several meetings have been held. There is an improved interest taken by the members, and a general desire manifested to elevate the agriculturist to that sphere of usefulness, responsibility and respect that his calling duly entitles him to occupy. There is a manifest wish on the part of the members of this association to exert such an influence on the farmers of the county as to induce them to no longer regard their calling as one of toil and drudgery, undeserving of recognition in social circles, and only followed because they have not the ability to command a commercial pursuit; but, on the contrary, to have them esteem the name of farmer, and regard their pursuit as of equal honor as that of merchant, manufacturer or the professional callings. An effort has also been made to induce them to pay more attention to affairs of State, and to combine and exert an influence on the law-making and governing bodies commensurate with their standing and the burdens of taxation they are forced to carry. The proof of the foregoing assertions will become manifest by the reports and resolutions hereunto annexed.

At the annual meeting held on the 25th ultimo, information was received that an effort was being made to rush a bill through the Legislature repealing the laws creating and sustaining the Experiment Station. Believing such a step to be a serious blow to the agricultural interests of the State, a memorial was prepared and sent to the President of the Senate, who, in turn, promptly presented it to that body, setting forth the advantages we have derived from the Station, and asking that the bill for its abolishment be not passed. Resolutions of like tendency were also adopted asking the members from our county to withhold their support from any measure having for its object the abolishment of the State Experiment Station, and a copy sent to each member of the Legislature from this county.

Information was also received that two bills had been introduced into the House of Assembly having for their object the exemption of \$200 from taxation of the personal property of individual taxpayers, and the following resolutions were adopted :

WHEREAS, Information having been furnished this association that a bill has been introduced into the Legislature designed to exempt \$200 of personal property from each individual taxpayer of the State; therefore, be it

Resolved, That we view with alarm any measure tending to deprive a class of individuals from the responsibilities of State, as not in accord with the intent and spirit of our institutions and form of government.

Resolved, That we accept the doctrine that this is a government of the people, for the people, and by the people; that the responsibilities of government should rest with the people, and be born equitably by all.

Resolved, That we hereby request our representatives in the Legislature to withhold their support from Assembly Bill, No. 8, or any measure of like tendency that may come before them.

Resolved, That a copy of these resolutions be indorsed by the secretary, and sent to each member of the Legislature from this county.

During the early spring meetings of the association, several members announced their intention of making tests and experiments with different matters appertaining to agriculture, and, as before stated, were encouraged to do so by the association. For the purpose of ascertaining to what extent these intentions had been carried out, a circular was addressed to the most prominent farmers of the county, containing the following questions, viz.:

Was your crop of potatoes a large one (if not, state its percentage of a crop)?.....

.....

What was the yield of your wheat crop, and its quality?.....

What was the yield of rye (if not a full crop, state its percentage)?.....

What was the yield of corn (if not a full crop, state its percentage)?.....

What was your best paying crop this season?.....

What small fruits did you raise, and how were the crops?.....

Did you make any experimental trials of fertilizers or seeds?.....

What was your result with poultry?.....

What kind of poultry did you find most profitable?.....

How many cows do you keep, and what are the gross receipts per cow?.....

The intelligent manner in which these questions were answered is an encouraging evidence of the advance in agricultural knowledge and practice in this county. Twenty-one replies estimated the potato

crop to be sixty per cent. of a full crop ; average yield of wheat per acre, twenty-seven bushels ; corn, forty-four and two-thirds bushels of shelled corn. A few reported rye, which averaged twenty-one bushels. Those that reported oats gave the yield large, about fifty bushels per acre, quality good. Ten reported good results with poultry, six made bad reports, and two reported thieves had robbed them of their breeding stock. The favorite breed seemed to be Plymouth Rock, although several other strains were reported. Nine reported chickens as the most profitable kind of poultry, one thought turkeys, one ducks, and one geese ; several that no poultry was profitable. The best paying crops for the past season, five reported tomatoes ; two, sweet potatoes ; one, wheat ; two, strawberries ; one, fruit ; five cabbage ; one, the dairy ; one, sugar corn ; one, peas ; ten reported raising small fruits.

The following are the reports from the dairy : No. 1 reported twelve cows ; average gross receipts per cow, \$80.00 ; wholesales milk ; feeds during winter on wheat bran and mixed hay, corn stalks fed in the yard ; cattle stabled at night. No. 2 reported thirty cows ; average per cow, \$166.00 ; retails milk ; feeds on wheat bran, corn meal and brewers' grains. No. 3, twelve cows ; average now \$105.00 ; year not up until April 7th ; feeds on corn meal, clover hay and corn stalks ; sells milk and cream wholesale, and retails what butter is sold ; uses three gallons of milk per day and seven pounds of butter per week for home consumption. No. 4 reports twenty-six cows, averaging \$72.00 per head ; wholesales milk ; feeds all dry feed and corn stalks. No. 5 reports twenty-four cows, averaging \$50.00 per cow ; fats calves and sells what butter is not needed for the family ; feeds dry feed ; gives no extra attention to the dairy. No. 6 reports twenty cows, averaging \$65.00 per cow ; wholesales milk. No. 8 reports fifteen cows, averaging \$75.00 per head ; wholesales milk ; feeds on corn meal, wheat bran, brewers' grains, hay and corn stalks in yard. No. 10 reports twenty cows ; average \$130.00 per cow ; reports bad luck with his cows ; retails milk.

I have been unable to get reports from our largest retail dairies, of which there are several milking from thirty to fifty cows each.

The following trials and experiments were also reported :

R. Levis Shivers says from five bushels of Burbank potatoes, planted June 20th, and the same number of bushels of Peerless, he dug 500 baskets of marketable potatoes. Bugs did not care for them ; used nothing on the vines.

Another report says, our sweet potatoes averaged 400 baskets per acre in a field of twelve acres.

Another says blackbirds destroyed one hundred bushels of corn for him before seed was ripe.

J. Stokes Coles gives the following result with poultry. Stock on hand one year ago, forty hens, and thirty-five or forty chickens, the latter mostly marketed in January :

Sold 121 pairs of chickens.....	\$166 60
Sold 343 dozen eggs.....	96 58
Total cash receipts.....	<u>\$263 18</u>

To which add value of seventy-three dozen eggs used by the family at twenty-five cents per dozen—\$18.25, making \$281.43 as the value of the product, besides many fowls used at home from which no account is made.

Jos. M. Kaighn & Sons report their wheat good ; ten acres yielding 420 bushels, thresher's measure, sold from the machine, weighing sixty-five pounds per bushel ; variety, Fultz. Yellow corn, a fair yield for the season, cut up six by six ; when husked, four stacks were thrown to a heap, which, picked up, gave ten ordinary farm baskets of sound, one and one-half to two of offal corn. White potatoes, about two-thirds of a crop ; planted mostly Early Beauty of Hebron and Early Rose ; we also tested 216 varieties, and would say that fully two-thirds of them proved worthless. Tomatoes were a good crop ; Paragon the principal variety, although we planted twenty-six kinds, among them the Jaggard, which proves to be first-rate, being early, large, smooth, and a good cropper. Early cabbage, good Winningstadt, always ahead ; Flat Dutch did well for late, being very large and solid. Sweet potatoes, a fair crop, short and chunky ; the new Early Golden Yellow, introduced from the Department of Agriculture by Senator Sewell, grow very large, eight of them filled a truck basket. We think they will make a good early variety, much better than the old Bermuda ; they grow compactly in the hill, of good color, and not having the coarse white streaks through the flesh so common in the Bermuda, or so-called Yam. Citrons were good, rough, and flavor hard to be excelled ; all points considered, old Jenny Lind the best. Sugar corn, with us, is a specialty, and we consider it one of the most profitable crops ; by successive plantings we have it until frost, and aside from its market value, the stalks and fodder

repay the cultivation as a food for cattle at the close of summer. Apples, pears and cherries were only a partial crop, but prices for what was marketed were satisfactory.

Edward Burrough gave the following report of a comparative test with eighteen varieties of potatoes :

The ground, a sandy loam, in cabbage the year previous. Manured broadcast with hog manure during the winter. This was plowed down in the spring and the ground thoroughly harrowed. April 18th, 1882, furrows were opened three feet apart and the potatoes dropped twelve inches apart in the row. Used Walton & Whann's plow brand phosphate in the row, at the rate of four hundred pounds per acre. They were all weighed and planted the same afternoon, cultivated alike in every particular, and dug August 19th. The dry weather seriously damaged the whole plot, although a few of the later varieties seemed to partially recover ; but as two-thirds of the plot was fully ripe and vines dead, I decided to dig them all. Each variety was carefully weighed again when dug. The quantity planted was exactly uniform in measure, being just one-half peck of each variety, except the White Elephant, although there was considerable difference in weights.

All of these varieties came up nicely, scarcely a missing hill in the plot. Came through the ground so near together that I could detect no difference between those called extra early, early and late varieties.

No.	NAME OF VARIETY.	POUNDS PLANTED.	POUNDS HARVESTED.	REMARKS.
1	American Magnum			
	Bonum	8 lbs. 0 oz.	85 lbs.	Vines ripe when dug.
2	Early Rose.....	6 5	143	Vines ripe when dug.
3	Early Beauty of			
	Hebron.....	6 5	140	Vines ripe when dug.
4	Chicago Market	8 9	151	Vines ripe when dug.
5	Extra Early Peach			
	Blow.....	7 13	69	Vines ripe July 15th.
6	Early Household.....	7 15½	96	Vines ripe July 20th.
7	Bliss Triumph.....	7 9½	127	Vines ripe July 10th.
8	Alpha.....	8 12½	100	Vines ripe July 20th.
9	Clark's No. 1.....	8 ½	111	Vines ripe August 8th.
10	Belle.....	7 10	119	Ripe when dug.
11	Queen of the Valley...	7 9	124	Not dead when dug.
12	Burrough's Garfield.....	8 9	184	Vines not dead when dug.
13	American Giant.....	7 12	172	Vines not dead when dug.
14	Pride of America.....	7 11	132	Vines ripe when dug.
15	Saint Patrick.....	7 11	177	Vines not ripe when dug.
16	Mammoth Pearl.....	8 11	149	Vines dead when dug.
17	Watson's Seedling	7 11½	101	Vines dead ; cedars hurt them.
18	White Elephant.....	1 15	23	Not a half peck ; trees hurt.

The following other varieties were planted in like manner on heavy land, but the dry and wet weather interfered with them to such an extent that the trial was abandoned: Snowflake, Matchless, Adirondack, Monitors, Peerless, Late Beauty of Hebron. What were gathered of these were of better size than those of light land, but the rot spoiled the trial. Out of the above list there are several that merit more extended trials. I shall probably plant most of them again.

Another farmer gave the following report: For several years past we have been making strawberries and onions our principal crops. The past season we had between six and seven acres of strawberries, which yielded 27,000 quarts; one acre of onions, 280 baskets; one acre of sets, from which we have sold 200 baskets of pickling onions, and suppose I have 100 baskets of sets *still*. We have two acres in peach trees which yielded 500 baskets; raspberries were in an orchard—suppose would stand on one-quarter of an acre—yielded 1,554 pints; blackberries, one-half acre, yielded 2,236 quarts. The remainder of the crops were not accurately kept account of, and were only limited. About two acres of potatoes yielded about 400 baskets, after which we grew on one and one-quarter acres of it about 200 baskets of turnips; about three-quarters of an acre of citron and beans, and one-quarter of an acre of squashes and beans, alternate rows, yielded about 300 baskets citron, sixty-eight baskets beans, seventy-two baskets squash, beside two cart loads fed to hogs; about two acres of sweet potatoes, or 12,000 plants, yielded 500 baskets; one-quarter of an acre of cow beets, yielded 200 baskets; one-eighth acre carrots did poor, only about twenty-five baskets. A small patch of pumpkins and sugar corn comprised the extent of our truck, except an acre and a half plowed and planed in cabbage too late to mature.

The season, to say the least, has been an eccentric one, the cold wet weather in April and May, greatly retarded vegetation, the early planted corn suffered considerable from rot, and, in many instances, early potatoes failed to come up, and fields presented a ragged appearance. The cold nights and heavy dews seriously affected strawberries and other small fruits, rendering the season late and quality only medium. This was followed by a period of dry weather which greatly damaged the potato crop. Another spell of dry weather damaged the corn crop and pastures, although the latter recovered and lasted until snow covered it. Altogether, the season has been a

fair one, and notwithstanding the advance in the wages of farm labor, farmers have, as a rule, held their own, and perhaps their condition is a little better than at the same period last year. Wages have an upward tendency, but farmers seem slow in making contracts. Much anxiety is felt regarding the stopping of so many mills in Philadelphia and elsewhere, as to what effect it will have on the markets, and whether the idle workmen will seek employment upon farms. Considerable excitement was caused by the arrest and trial of some of our most prominent dairymen by the State Inspector of Milk. There is a general feeling that the law is an unjust one, and a desire manifested that the State Board of Agriculture should carry out its action last year by adjusting the milk law so as to do equal justice to consumer and producer.

CUMBERLAND COUNTY AGRICULTURAL SOCIETY.

Mr. Morris Bacon reported their membership 600, and said that a fair, lasting two days, is held annually. At the last annual meeting it was voted that money be raised and permanent exhibition buildings be erected.

VINELAND AGRICULTURAL SOCIETY.

Mr. Philip Snyder made a brief report, saying the society was doing a good work.

GLOUCESTER COUNTY BOARD OF AGRICULTURE.

Mr. Chalkley Duell reported that not much had been done in his county, as the society was not organized until the latter part of the year, but hoped to be able to make a good report at the next meeting.

HUNTERDON COUNTY AGRICULTURAL SOCIETY.

Mr. Willard C. Parker spoke for this society, and said he hoped that some plan would be devised or arrangement perfected by which the time for holding fairs could be arranged so that they would not conflict one with another, and asked for a conference committee to adjust this important matter.

MERCER COUNTY.

Mr. James Van Deventer reported that their society held no exhibitions, but met at regular intervals, and their meetings were productive of sound, practical results.

HOPEWELL FARMERS' CLUB.

Mr. A. L. Holcombe reported nothing new in their society. Crops were good, and the farmers were prosperous.

MONMOUTH COUNTY AGRICULTURAL SOCIETY.

Mr. James J. Conover reported that the annual fair was well attended and was otherwise successful. He reported on crops as follows: Corn, good; wheat, extra good; potatoes, early, good; late, medium.

SALEM COUNTY AGRICULTURAL SOCIETY.

Mr. Omar Borton reported that the society had held twelve annual fairs. Hitherto there had been no railroad to the place, which had militated against them. Now, however, railroad connection had been made, and he thought their fairs would be more successful.

(For fuller reports from societies see statements in latter part of the report.)

Adjourned.

TUESDAY AFTERNOON.

At 2:30 P. M. the Board was called to order.

A report of the Committee on Credentials was received.

President Dudley delivered his annual address, which will be found printed in full in the report.

Dr. E. M. Hunt spoke on "Diseases of Domestic Animals." He said he was glad to have an opportunity to meet with and to talk to

the farmers of New Jersey, for no class of men stood more in need of union of purposes and a unity of action. No class of people in a community suffer more from the position they occupy in reference to middlemen. This was a matter that needed prompt adjustment. In reference to the diseases of cattle, Dr. Hunt said that every farmer had a direct personal interest in them, and to keep them in good health is a matter of vital interest. If the health of the cattle is not maintained they are seriously affected from a money point of view. Also, their health is affected when meat from diseased cattle is used.

Through the efforts of the State Board of Health in the years past, pleuro-pneumonia and other contagious cattle diseases have been eradicated from the State, and now there is but little danger, except from the importation of diseased cattle into the State. Too much care cannot be taken to have the stables where cattle are kept well ventilated, as many diseases arise from this cause, and in many cases when cattle are diseased it is very difficult to get a competent veterinary surgeon to treat them. It is unfortunate, but none the less true, that while there are many who are entirely competent to doctor a horse, but few indeed are capable of taking charge of a sick cow. This is a matter that needs reforming. Recently an important discovery has been made. It is now certain that by inoculation most cattle can be made unsusceptible to pleuro-pneumonia and other contagious diseases. He had long been of this opinion, and had practiced inoculation. It should be done, however, only under the surveillance of the State authorities. In conclusion, Dr. Hunt said that had he selected his own subject he would have spoken upon those higher animals, "The Farmer and the Farmer's Wife and Children."

At the conclusion of Dr. Hunt's address, Mr. P. T. Quinn said that Mr. M. M. Dodd, of Essex county, had practiced the inoculation of cattle, to prevent the spread of pleuro-pneumonia, for a number of years, with great success, and he was glad to hear that the State Board of Health *now* accepted Mr. Dodd's method.

Upon the motion of Mr. Burrough, a vote of thanks was extended by the Board to Dr. Hunt.

A paper on "The Cultivation of Carp" was read by Mr. Milton P. Pearce, Assistant United States Fish Commissioner.

At the conclusion of Mr. Pearce's address, Hon. William Parry

related his experience in the business of raising carp for profit, which had been highly satisfactory.

Owing to the lateness of the hour, Mr. Amos Ebert's paper on "Carp Culture" was deferred until Wednesday morning.

Adjourned.

TUESDAY EVENING.

Upon the organization of the evening session, President Dudley introduced ex-Governor James Pollock, of Pennsylvania, whose address will be found printed in full in the body of the report.

WEDNESDAY MORNING SESSION.

CONFERENCE OF BOARD OF AGRICULTURE WITH MEMBERS OF THE LEGISLATURE.

Upon the invitation of the agricultural members of the Legislature, the Board of Agriculture assembled at 8:30 A. M. on Wednesday, for the purpose of giving expression to their views in reference to necessary legislation to protect and foster the interests of the farmer.

The meeting was called to order by President Dudley, who, after briefly stating the object of the meeting, spoke earnestly against the passage of a bill which was before the Legislature, having for its object the repeal of the bill creating the Agricultural Experiment Station. He said that this institution was constantly giving efficient aid to the inquiring agriculturist, and was the means of saving to the farmers thousands of dollars annually. Not only would the farmers ask that the Station be continued, but they would demand that a more liberal appropriation be made to it annually, that its laboratory may be extended, that a farm for field experiments be purchased, that its usefulness may be increased, and that the land may be made to produce in crops double what it now does. President Dudley said that in the near future the Experiment Station would be called upon to settle the disputes constantly arising in reference to the sale of milk, either adulterated or impure.

Mr. E. Williams, of Montclair, said we have a very diversified soil in the State, and needed scientific information in reference to it, which the Experiment Station alone could give. While he endorsed the practicing of economy, it was not wise to begin it at the wrong end. Before the establishment of the Station, he had been obliged to apply to experiment stations in other States for information in regard to diseases of fruit trees and vines.

Mr. Dudley said that it had been charged that the demand for the abolishment of the Experiment Station had come from the farmers of East Jersey, and asked Mr. Williams if that was true.

Mr. Williams said it was not true; that he had never heard a farmer speak against the Experiment Station.

Mr. J. H. Baldwin, of Livingston, said that the farmers of his section greatly appreciated the Experiment Station, and were constantly seeking for its bulletins and reports.

Mr. Satterthwaite, of Burlington Grange, said he had been appointed a committee by Burlington Grange to look after legislation affecting agriculturists, and among other bills that had been introduced that was calculated to be detrimental to farmers, was that which exempts personal property to the amount of \$200 from taxation; the effect of it would be to increase the burden now borne by the farming community; also protested against the bill abolishing the Experiment Station.

Mr. Matthews, of Atlantic county, said that the last bulletin issued by the Experiment Station was alone worth more than the whole \$8,000 appropriated to maintain the Station.

Mr. Amos Ebert made some interesting comparisons of the prices and valuation of fertilizers eight or ten years ago, before the Experiment Station was established, with those now in the market for sale. The selling price, ten years ago, of fertilizers was from \$30 to \$50 per ton, but the valuation of many of them was not more than from \$10 to \$16 per ton. The average valuation of fertilizers now sold is upwards of seventy-five per cent. of the selling price.

Prof. Cook spoke briefly for the Experiment Station, and said that if it would not stand on its merits, then it was not wanted.

Mr. Burrough said he did not wish to tire the members of the Legislature, but there were still several matters to be brought to their attention. *First.* The horticultural interests of the State needed fostering, and it could doubtless be best done through the State

Horticultural Society. *Second.* There was that much talked of but still unsettled question of milk; for the farmers he would say that they were not opposed to any law for the protection of the consumer if it was made equitable to the farmer. *Third.* There was a bill before the Legislature requiring every box or basket used in the selling of small fruit to be distinctly marked with the amount of its measured contents. This was calculated to take time, and be expensive without accomplishing any good results.

Mr. Parry called attention to the advisability of encouraging "carp culture."

Adjourned.

WEDNESDAY MORNING.

The morning session was opened by the reading of an able paper by Mr. Amos Ebert on "Carp Culture," which is published in full in the body of the report.

President Dudley followed with an able address on the work of the "Experiment Station." He said the work was conducted as it had been in the past. Prof. Geo. H. Cook is the Director, and of him too much cannot be said in praise. Prof. Arthur T. Neale, the Chemist, is as good as can be got. He has two assistants, and ought to have three, as the Directors of the Station are liable to prosecution if incorrect analyses are published; it is very important that they be made with great accuracy. But few know of how great value the Station really is, but a computation shows that over \$200,000 was saved to the farmers last year. The manufacturers know of its existence and keep their goods up to the required standard. He then related some of the methods adopted by a manufacturer of fertilizers to get a favorable analysis, and how, when an analysis was made, the stuff was found to be about fifteen per cent. below standard. It is needless to say that now there is no market for the goods of this manufacturer in this State.

Prof. George H. Cook, Director of the Agricultural Experiment Station, was introduced, and said it was very little he wished to say. He wished to congratulate the State Board of Agriculture for bringing together such a body as was seated in that room. He thought

them worthy of the Massachusetts title, "the General Court." When a young man, he had lived in New York, and was accustomed to hear New Jersey sneered at, but he was proud to get back to it again. Washington had very properly called it "the garden of the country."

In reference to the subject of fertilizers now up for discussion, he was sorry that, owing to pressing engagements elsewhere, he could not remain and take part, but Dr. A. T. Neale (Chemist of the Station), at his request, had kindly consented to take his place.

He was glad to see present among them to participate in the discussion the son of the late Prof. James J. Mapes, whom you all knew so well, by reputation at least, and who did so much for the farmers in his labors in advanced agriculture. We now have with us his son, my friend Charles V. Mapes, who, in his knowledge of the subject, stands in the front ranks. He has studied industriously and has worked conscientiously to help the farmers. I believe he has tried as hard to serve the farmers' true interests as any one in this room. He knows how to make good fertilizers adapted to their needs, and he is making as good ones as he knows how to make. They are reliable, and may be depended upon. You may be sure of getting what you buy—getting what is guaranteed. I am glad to stand here and authoritatively make these statements. Mr. Mapes, of course, expects to make money, and so he should. I hope he will make a fortune for he certainly deserves it.

Farmers are apt to think that they can buy the ingredients and make their own fertilizers for less than they can be bought ready prepared; but he could assure them it was not so. He had examined many of these home-made mixtures, and while they might seem to be cheap, measured by the cost per ton, they did not possess the fertilizing strength or value that they were supposed to have.

The manufacturer has every advantage over the farmers in his knowledge of the subject, knowledge of the market, capital to buy at best advantage, and facilities for manufacture. He can sell them an article of *full value* and yet make money.

DISCUSSION ON FERTILIZERS.

President Dudley called on Mr. Charles V. Mapes, of New York, to open the discussion.

Question was asked by one of the delegates—"Do we need nitrogen

in a fertilizer? We see that some manufacturers, who offer plain superphosphates, claim that we do not. Do these fertilizers exhaust the soil?"

REMARKS BY CHARLES V. MAPES.

This is an important question to the farmer. Nitrogen is the most expensive ingredient in all commercial fertilizers.

It is often asked: Do nitrogen and ammonia mean the same thing? Strictly speaking, they do not; but the terms are often so used. Ammonia is composed of fourteen parts (by weight) of nitrogen, and three parts of hydrogen. So, when, by conversion in the soil or manure heap, a portion of the nitrogen becomes changed into ammonia, fourteen pounds of the former will represent seventeen pounds of the latter. It is nitrogen, and not ammonia, that is generally found in plants and soils as well as in fertilizers. When sulphate of ammonia is used in a fertilizer, then the ammonia exists as ready formed ammonia, and not as nitrogen. But in dried blood, flesh, fish, cotton seed and the commonly known ammoniacal materials, there is no ammonia whatever, only nitrogen.

Crops vary greatly in their ability to help themselves to the nitrogen required for their growth. Clover, for instance, with its far and deep-reaching roots, can get it out of the soil, both from the surface and lower layers, when other crops, like wheat, barley, potatoes, grasses and other more dainty feeding and more shallow-rooted crops are unable to obtain the necessary supply. Corn can also help itself to nitrogen to a remarkable degree. As shown by the numerous corn experiments throughout the country during the past few years, there is seldom any economy in supplying in a fertilizer more than one-fourth to one-third the total amount of nitrogen contained in an average crop of corn, (fifty bushels of shelled corn per acre). Larger application of nitrogen failed to bring profitable returns. But corn cannot be grown continuously with plain superphosphate without certain and rapid deterioration of the land.

Turnips thrive well on good lands with fertilizers containing very little, and, in some cases, no nitrogen. In England, where this experience is gained, they practice a four-year rotation—turnips, wheat, clover, barley; the turnips, manured with plain superphosphates, are fed to sheep on the land, and the sheep fed with feeding cakes rich in nitrogen, which all goes to the land; nothing is sold from

the land but mutton and grain. In this case, no exhaustion follows the use of plain superphosphate on turnips.

Some of the grain crops can get on with much less nitrogen in available form than others. These are buckwheat, rye and oats; they can help themselves where wheat and barley would suffer.

The wheat, barley, hay (from timothy or mixed grasses), potatoes, onions, and all vegetables (except beans and peas), are largely dependent for success upon nitrogen, supplied in easily available forms and in liberal quantities, and in the absence of a supply of this ingredient the land is practically exhausted and will not profitably respond to applications of anything else.

In the thirty years' continuous growing of wheat in the world-renowned experiments of Dr. Lawes, of England, the plain superphosphate, *even with the addition of potash, magnesia and soda, but WITHOUT NITROGEN*, produced an average increase for the whole time of only one and one-quarter bushels per acre per annum above the yield from the natural soil. The yield from the natural soil was fifteen and three-quarters bushels. This was the average yield for the thirty years. Some years it was only three or four bushels, and some years twenty-three bushels. When nitrogen, in the form of salts of ammonia (sulphate of ammonia) was added to the mixture of plain superphosphate, potash, magnesia and soda, the yield went up to an average of thirty-five and one-quarter bushels per annum, as much, within about one-half bushel, as from an annual dressing of over fifteen short tons of farm-yard manure. There were no signs of exhaustion of the soil at the end of thirty years, even with this heavy continuous cropping of wheat with the chemicals alone. But in this case *all the leading fertilizing ingredients* were supplied, including nitrogen.

Similar results followed experiments in growing barley for some twenty years with and without nitrogen.

In regard to this continuous use of superphosphate without nitrogen, Dr. Lawes states that in every instance where the land had been kept under one crop the "results have been of a very negative description." On permanent pastures, the use of plain superphosphate for over twenty years did not increase the hay more than some 100 pounds per acre over the yield of the natural soil.

The indirect action of a fertilizer in producing good crops for a few seasons must not be overlooked. These results, however, may not

be due to the supplying of additional plant-food, but simply by stimulating the land, to cause it to give up from its own resources what it otherwise would be unable at the time to supply in available form to the crop; but in such case exhaustion soon follows.

You have frequently heard farmers discuss the merits and demerits of plaster; some claiming it was worth more than any other fertilizer, others unwilling to admit that it had any value.

Some years since in New York State, as you all know, plaster, when first used, worked wonders. A few bushels, costing a trifle, in some sections nearly doubled the grain and grass crops. But its general use was soon followed by rapidly declining crops, until farmers bemoaned the condition of their lands as *plaster sick*, and as some one has said *plaster dead*.

Potato lands that produced watery inferior tubers, deficient in starch, almost worthless for eating, and very small crops at that, were made by a liberal dressing of plaster to turn out good crops of superior potatoes, large, smooth and mealy, when cooked; rich in starch. It might naturally be supposed that this result was due to the crop-feeding value of the lime (in the plaster) on the crop. What else could have done it? But soon exhaustion followed, and the land failed to respond to any manure, the same as with the exhausted wheat and grass lands; now, why was this?

The answer was found in the patient work at one of the agricultural Stations in France, by the chemist Dehérain.

Samples of soil were taken from fields where the farmers found in practice that plaster produced marked results, and also samples from lands where in practice plaster failed to have any beneficial effect. All these samples, of same weight, were each put into jars and thoroughly shaken up with the same quantity of water, but to which had been added a small quantity of plaster—same quantity to each jar. Upon examination of the liquid in each bottle there was found to be dissolved some of the ingredients of the soil, some potash, some magnesia, soda, etc., more than pure water would dissolve from the same soils. There was, however, this striking difference in the action of the plaster as between the two soils. In the case of the soil where plaster had in practice failed to increase the crops, there was found to be but a small quantity of plant-food taken out of the sample of soil by the water and plaster, but on the other hand with the soil where plaster had worked so well in the field, increasing the crops, the

action of the water surcharged with plaster had been very marked, and had dissolved out a very considerable quantity of potash, magnesia, soda and other plant-food ingredients. As only about one part of plaster is taken up by some four hundred parts of water, it will be seen how powerful the effect of the plaster was on the soil.

This experiment, a laboratory one, and such as we all have been accustomed to value so lightly, explained *one of the reasons* why plaster acted so differently. Such soils as contained plant-food ingredients in a condition susceptible to the dissolving action of water and plaster, might respond to plaster; but another soil, where the ingredients were too inert or too firmly locked up to enable the water and plaster to dissolve them, then other means than plaster must be employed.

The effect of the plaster in producing for a season or so the striking results as described on potatoes—the improvement to their cooking quality and richness in starch—also found here an explanation. The action of potash in developing the formation of starch, not only in potatoes, but in all other crops, had been demonstrated by other experiments, and now it was readily seen how the action of the plaster in dissolving some of the most available potash in the soil, had enabled the crop to perfect itself, but not by the *direct* supplying any plant-food, but by its *indirect* action on the soil, exhausting it rapidly. Common salt is another example, in its action, of the stimulating and delusive effects of some fertilizers. Salt often shows marked effects on naturally good lands, or such as have been liberally manured. It is found where applied at the rate of three to six bushels per acre to wheat and barley, to stiffen and brighten the straw and, in many cases, to increase the yield of grain by several bushels. One enthusiastic writer, referring, in a recent number of the "*Country Gentleman*" to some striking results from the use of dressings of salt on spring wheat, strongly advocated its general use on this crop, claiming that the New York grower could readily, at an expenditure of a few shillings per acre, reap some thirty bushels of spring wheat per acre, and outstrip the growers of spring wheat in Minnesota and other far west sections, where the yield was not a third of this quantity per acre. Such a course might promise well for a time, but in the absence of returning *in available form* a portion, at least, of the nitrogen, phosphoric acid and potash taken off by the wheat crop from the surface layer of soil, exhaustion would soon follow, and the land would become *salt sick* and as badly off as the *plaster sick* land.

Similar results follow the use of any one-sided, incomplete fertilizer, particularly when continued for any length of time.

Dr. Voeleker, of England, Chemist of the Royal Agricultural Society, points out equally unsatisfactory or even disastrous effects following the use of nitrate of soda, sulphate of ammonia, as well as plain superphosphate and potash on various crops.

There is, however, another and more natural process of unlocking the stored-up resources of the soil which has been practiced for a hundred years and more, and has been successful in keeping the land up in condition of continued and profitable cropping, without any apparent exhaustion.

You have in New Jersey well-known instances of this in Warren county, where the soil, without the aid of fertilizers, has, by a judicious rotation and frequent crops of clover plowed under, been kept up in good condition for some hundred years.

In the famous Genessee valley, in New York State, the wheat crop, on a rich loam mixed with decomposed slate rock, has been for some seventy-five years maintained at a high figure. But this has been due to clover crops, which have been grown and plowed under as a preparation for the wheat crop.

The explanation of the action of clover in manuring wheat is known to you all; how it takes up from the lower and deeper layers of soil the plant-food ingredients, and by the decomposition of its roots and stubble (over 6,000 pounds per acre,) distributes them in the upper layers of the soil, within easy reach and easy assimilation by the grain crop.

The same results follow, in a lesser degree, the growing and plowing under of buckwheat and rye.

The power of these green manuring crops to add to the available fertility of the soil is well illustrated by an experiment for which we are again indebted to the Agricultural Stations.

The purpose of this experiment was to determine the action of plant roots on rock dust. Two kinds of rocks were experimented with, basalt and sandstone. Boxes or vessels were filled with same quantity each of each rock, powdered coarsely, and all the boxes except two of the basalt and two of the sandstone were planted with rye, buckwheat, peas, etc. Cotton batting was put on the top of each box and around the stems of the growing plants so as to protect them from dust. The boxes were all, including the four without plants,

watered with pure water; when the plants had done growing at the end of the season, the boxes were emptied and upon examination of the disintegrated rock there was found to be a considerable quantity of soil soluble in very dilute acid, and it was shown that in addition to the ingredients which the plants had taken from the rock powder, a considerable portion of what remained in the boxes where the plants had grown, had been made soluble, much more than in the boxes where no plants had been growing. Another interesting fact that was brought out was, that those crops, valued in practice the most highly by farmers for green manuring—like peas, buckwheat, rye—exercised the most power in decomposing the powdered rock. A soil can be improved by judicious cropping.

The soil is, strictly speaking, inexhaustible; average good soils will contain in the surface layer of an acre to the depth of a foot, some 24,000 pounds of the three important plant-food ingredients, nitrogen, phosphoric acid and potash, sufficient for 300 wheat crops, and if all were available to the feeding capacities of plants there would be no necessity of artificial supplies of fertilizers, and there would seldom be any such thing known as exhaustion of soils, but the fact is, that only a very small proportion is soluble in water of the soil under the most favorable conditions. Seldom there is found more than very few pounds of *available* phosphoric acid in 100,000 pounds of soil, and often times not more than a trace of phosphoric acid is found to be soluble in water; the same is true, but not to the same degree with nitrogen and potash. The phosphoric acid as found in soils is the least soluble, and it is for this reason that nearly all soils and all crops demand the presence of this ingredient in soluble form in a fertilizer.

The only safe way to use fertilizers, with the view of maintaining the fertility of the soil up to a profitable point, is to maintain the supply in the soil of these three ingredients, nitrogen, phosphoric acid and potash *in available forms*, and in the large majority of cases, particularly in the most profitable farming, this can only be done by supplying them from outside sources in the form of fertilizers. It is an economic question of great importance to the farmer to know to what extent he can reduce the proportions in a fertilizer of either of these expensive ingredients.

This can only be ascertained by experiment, and I know of no better way than one which, at my suggestion, has successfully been practiced by many New Jersey farmers.

Take a crop like corn or potatoes, or wheat followed by grass, or any other crop. Use the fertilizer, which in the light of your information appears to be the best adapted for your purpose, say one rich in phosphoric acid and containing a moderate quantity of nitrogen and potash; then take two strips, running lengthwise through the field, so as to make the strip as long as convenient, and so overcome, as far as possible, any natural inequalities of soil. Try a fertilizer similar to the one you have first selected, but containing say double the nitrogen (or ammonia). Now the results from this strip should, during an average good season, indicate whether you can realize a sufficient increase of crop from an extra quantity of nitrogen to justify the extra cost. On the other strip, put another question to the field, and let the inquiry be this time, Can I increase the proportion of potash to a profit? To get an answer to this question, apply a fertilizer similar to the one first selected, excepting that it shall contain double the quantity of potash. If an increased yield is more than sufficient to pay for the extra amount of potash applied, then it may be judicious to use a fertilizer on that field richer in potash.

The fertilizer that will prove the safest, both for economy and for certainty of effects, is the one that combines some of *all three* of the leading valuable fertilizing ingredients. In the absence of any one of these ingredients it can be used only to temporary advantage. In the absence of nitrogen the grain crop may be increased by the action of the fertilizer in promoting quicker growth and earlier maturity, but it will be at the expense of the soil, and the subsequent grass will suffer.

When thrown entirely on his own resources for a decision, the farmer had better select a fertilizer, running low in nitrogen, high in phosphoric acid and low in potash, and then with a very little experience and experimenting, he can soon determine how far the percentages of nitrogen and potash may be profitably increased for his purposes. But the continued use of any one-sided, incomplete fertilizer, plain superphosphate or anything else, must sooner or later lead to *exhaustion*, from which recuperation will be very slow.

Prof. Arthur T. Neale also spoke on the same subject. He stated what farmers were expected to understand from the *estimated values* of commercial fertilizers, as published in the bulletins of the State Experiment Station, and explained at length how these values

were calculated. He claimed that in order to use fertilizers with profit, field experiments, carefully planned and as carefully carried out, were absolutely necessary, and gave, as illustrations, figures drawn from several such trials made during the past season by farmers in various sections of this State. These figures seemed to show that results obtained in one section should not be accepted in another section, forcing the conclusion that each farming community must make a special study of its own soil. In closing, he asked delegates to place this matter before their respective clubs, and urge their coöperation with the Experiment Station in this work.

QUESTION BY DELEGATE FROM MIDDLESEX COUNTY.

“What are the advantages of having the different ingredients that compose a fertilizer—say, nitrogen, phosphoric acid and potash—derived from different sources and supplied in varied forms, say, nitrogen from nitrate of soda, sulphate of ammonia and dried blood, instead of all from a single source, as dried blood, (organic nitrogen)?”

REMARKS BY PROF. ARTHUR T. NEALE.

The nitrogen of dried blood and organic matter in general becomes available only after decomposition has changed it into nitrates. This is claimed to be true, also, of the nitrogen of sulphate of ammonia. The length of time necessary for this change varies; under favorable conditions, a few weeks only being necessary in case of ammonium sulphate, while dried blood, meat and fish-scrap are supposed to require rather more time. Horn meal, hair and wool-waste are less easily decomposed, while leather may remain for years unchanged, ultimately, however, its nitrogen will also become nitrated.

Nitrate of soda furnishes plants with nitrogen, without loss of time, and, in many cases, especially where it can be used repeatedly in small quantities as a top dressing, it is probably the best and cheapest source. The chief objection to its liberal use is that it is not absorbed or held in the soil, but finds its way easily and quickly into drains, or into the subsoil out of reach of plant roots. In order, therefore, to have nitrogen at all times in an available condition, a mixture of the three forms, nitrate of soda, ammonia salts and organic matter, appears rational.

In regard to SOLUBLE phosphoric acid, there is no good reason why that from one source should be superior to that from another. It is believed that SOLUBLE phosphoric acid from rock phosphates is quite as available as that from bones, or bone-black. The same applies to REVERTED phosphoric acid. In regard to INSOLUBLE phosphoric acid, that in bones may be preferable, although the finely ground rock phosphate, known as floats, may, in time, change this opinion.

A prejudice exists in favor of sulphate of potash; experiments made some years ago, showing its effect on the *quality* of certain crops, as tobacco, sugar, beets and potatoes to be much more favorable than that of muriate of potash. High authorities, however, believe, that if potash salts are used in the fall, and time allowed for muriates and any other injurious compounds to be washed out of the soil before the time for spring planting, no difference in the action of the different potash compounds will be observed.

Charles V. Mapes said: There was a great difference in the quality of crops, much more than was generally supposed. Their healthful development was largely dependent on proper feeding and the use of the right forms of the ingredient in a fertilizer. Tobacco growers in Connecticut, complain of the injurious effects of muriate of potash when used on tobacco. It does not affect unfavorably the growth of the crops; on the contrary, it contributes to it, but its injurious effects become very apparent during and after the process of curing the tobacco. The leaves acquire an uneven, spotted color, burn badly, and have an inferior flavor when made into cigars. The tobacco buyers find good reason for paying less money. The same result follows the use of common salt on tobacco, a fact that points to chlorine as one of the causes of the trouble. This action of muriate of potash on tobacco, I related to the chemist of a large fertilizer manufacturing company in England, some two years ago, and it struck him as very interesting, particularly, as he said, as tobacco was a crop they knew very little about in England. Some two weeks since the same gentleman in calling at my office, told me of some very interesting results from use of muriate of potash on turnips, showing serious damage to the feeding value of the crops. The crop *by weight* was largely increased as compared with the yield from the natural soil, but the actual amount of *dry solid* material was no greater, and the feeding value was less. The entire yield per acre might bring more money

to sell, but possessed actually less value for feeding than the smaller yield from the natural soil. He said that similar results followed the use of acid phosphate, particularly on soil deficient in vegetable matter. In fruit culture, we find a very marked difference in the action of the varied forms of potash in affecting the health of the trees and the quality of the fruit. In no crop is this more marked than in orange culture. The action of muriate of potash, especially when used alone on potatoes, has been very unsatisfactory, both in regard to quantity of yield and quality of product. The potatoes were apt to be watery and deficient in starch.

There is room for much useful research in the effect of varied forms of fertilizing ingredients used separately and in combination on the *quality* of crops. Prof. Peter Collier, of the Department of Agriculture, at Washington, recently reported that there was a difference of nearly fifty per cent. in the quality (feeding value) of the samples of wheat. The average of the three best samples contained nearly double as much albuminoids as the average of the three poorest samples, and that the same was true, only not to the same degree, with our staple crop, Indian corn.

The following resolutions, introduced by Mr. Burrough, were adopted, and the Secretary was requested to send a copy to Governor Ludlow, with the request that he transmit them to the Legislature:

WHEREAS, A bill has recently been introduced into the Legislature now in session, having for its object the repeal of the law creating the Agricultural Experiment Station, and all supplements thereto;

Be it resolved, That we, the members and delegates in attendance at the State Board of Agriculture, being fully cognizant of the advantages that have been derived from the State Experiment Station, the possibilities of the future and the benefits accruing therefrom, are of the opinion that its abolishment would be a direct blow to the agricultural interests of the State.

Resolved, That we hereby protest against the passage of any bill having for its object the abolishment or embarrassment of the State Experiment Station.

Resolved, That we are further of the opinion that additional funds should be provided by the State to enable the managers of the Experiment Station to properly conduct and complete field trials and experiments, and, if the same be necessary, to purchase a farm for that purpose.

ENSILAGE.

Mr. J. B. Brown read a paper on "Ensilage," which will be found in the body of the report.

Mr. John Mayer, Superintendent of the Havemeyer farm, at

Mountain Side, Ramapo, followed on the same subject. He gave in detail the plan of preparing ensilage. He said that they have a herd of 100 Jersey cows, and the necessity of feeding them brought the matter of ensilage under consideration. The silos were built in a side hill, of concrete, with walls two feet thick, so that if at any time they were not wanted for the purpose for which they were built they could readily be converted into a stable. Forty acres of land were prepared for the crop, and twenty two-horse loads of manure were used per acre; the corn was planted two feet six inches and three feet apart. When harvested it was, every pound, carefully weighed before it was cut. The poorest land yielded ten tons per acre and the best, twenty-three tons. The entire crop was harvested and the silos filled in nine days. As it was late in the evening when the last of it was put in, the covers were left off over night. In the morning he was aroused by one of the men, who reported that a fellow-workman had gone into the silo and had fallen unconscious before he could get out. Mr. Mayer at once hastened to the spot, and entered the silo to rescue the workman, but was overpowered by the gas, and he too fell unconscious as he was coming out. When he recovered consciousness he called a gang of men together and the covers were put on, and 300 pounds weight to the square foot were put on the covers. The mass settled down seven feet, or one-third of the depth of the silo. All of the cows were fed upon it at the rate of forty-five pounds per head per day, and two quarts of meal and two quarts of oats were also given them. The milk of the herd increased 100 pounds per day, and two per cent. more cream. The silos are now divided into twenty-four compartments. By systematizing the business he has been enabled to arrange it so that two silos are filled in a day and the covers and weights put on the same night. The feed is exposed twelve hours before feeding. The cost of the ensilage was exactly three dollars per ton, taking all things into consideration. The cost of feeding a cow for one year was sixty dollars, and a yearling was raised at an expense of thirty dollars. The average yield of milk per cow per day for one year was eight quarts.

Mr. Matthews moved that a committee be appointed to prepare necessary memorials to the Legislature. Adopted.

The report of the Nominating Committee was made by Chairman Hancock, as follows:

<i>President</i>	Hon. THOS. H. DUDLEY.....	Camden.
<i>Secretary</i>	P. T. QUINN	Newark.

EXECUTIVE COMMITTEE.

WM. S. TAYLOR.....	Burlington.	E. BURROUGH.....	Merchantville.
T. T. KINNEY.....	Newark.	Prof. MERRILL E. GATES..	New Brunswick.

The report was received, the committee discharged, and the officers unanimously elected as reported.

Hon. Wm. Parry, of the Committee on Grains, &c., exhibited on the tables, read the following report :

To the President of the State Board of Agriculture :

The committee appointed to examine and report on the grain, &c., on the tables, respectfully report that Edward Burrough, of Merchantville, Camden county, New Jersey, exhibits *common field corn*, yellow dent variety, very large and fine, fourteen inches in length.

Also, another variety called *Hinchman's Early*, valuable for late or replanting, twelve inches long ; yellow dent variety.

Mr. Burrough also exhibited two seedling potatoes, called *Burrough's Garfield*; they were about seven inches in length, and of fine appearance.

Van Buren Giffen exhibits a fine sample of yellow dent corn, eleven inches long, deep grains and fine appearance.

N. W. Parcell, of Elizabeth, Union county, exhibits fine samples of evergreen sweet corn ; also, two samples of yellow dent corn, very fine.

D. C. Lewis, Cranbury, Middlesex county, exhibits a handsome sample of Woodhull corn, light yellow dent variety ; said to yield eighty-six bushels per acre.

Also, sample of Blue Stem or Silver Straw wheat ; seventeen acres yielded at the rate of over thirty-four bushels per acre. Red wheat and Superior, grown from 460 pounds per acre of Mapes' complete manure ; no other fertilizer used on the same land for five years previous.

F. S. Holcombe exhibited a bunch of Clawson wheat, grown from compost of hog manure and muck ; yielded twenty-eight bushels per acre, having large handsome heads.

Also, Waterloo oats, very handsome, white and plump grains ;

weighed thirty-four pounds per bushel, and yielded forty-one bushels per acre.

Also, Schoenon oats, sent from the Agricultural Department about fifteen years since, and has proven to be a good variety, and is generally grown in his neighborhood.

Also, a fine sample of rye, good heads, well filled; sown on the fifth of November, and was much better than other rye that was sown a month earlier, showing that farmers do sometimes sow rye too early to produce the best results.

Also, yellow dent corn; yield, sixty bushels per acre.

Also, sample of eight-rowed flint corn; said to grow well on thin soil, suckers well, and produces a large amount of fodder.

Also, a sample of Fushau Island wheat, hybridized with Dodd wheat; having grown it for fifteen years, finds it a success.

Milton P. Pierce, United States Assistant Fish Commissioner, exhibited in a glass tank a handsome show of fish, mostly of food carp; some of a new variety of gold fish. He also gave a short description of the mode of cultivation, yield and value of carp, and its adaptation to the waters and climate of this State.

ENSILAGE.

John Mayer, from the farm of Theodore F. Havemeyer, Mountain-side, Bergen county, New Jersey, exhibited four packages of butter, of fine color and good quality, being a part of the production of 100 Jersey cows, fed on ensilage—a sample of which was also exhibited.

J. B. Brown, President of the Ensilage Congress in New York, exhibited a sample of the ensilage used by them. Both of the above gentlemen gave very interesting and instructive addresses, detailing the system and superiority of ensilage over the usual plan of feeding cattle without preparing their food.

WEDNESDAY AFTERNOON.

The afternoon session was opened by the reading of a paper on "Poultry," by the Rev. B. R. Black, and another on the same subject by W. S. Stoy. These will be found in another part of the report.

The "Milk" question was introduced by Prof. Newton, the State Inspector of Milk. He said he had little to add to what he had already said before the Board on the subject, but would willingly answer any questions or explain the law on the subject. He would say, however, that the enforcement of the law had the effect of keeping out of the market large quantities of skimmed and adulterated milk, and had accomplished much good in that way.

Mr. Burrough asked if twelve per cent. of milk solids was the minimum amount in pure milk?

Prof. Newton said he did not find in the State any pure milk of a lower grade.

Mr. Burrough asked if the standard should be reduced, would it not be more equitable?

Prof. Newton thought it unwise to reduce the standard.

Mr. Isaac S. Crane, asked if the farmer is responsible for milk after it has left his hands.

Prof. Newton said the farmer was not responsible.

Mr. Jasper Forsyth said he thought the law a great hardship for some. In his county, Camden, men whom he believed to be perfectly honest, had been fined for alleged adulteration of milk. He then went on to state that train hands on the railroads frequently steal and drink the milk, and fill up the cans with water.

Mr. David Roberts said he had found a glass in the bottom of one of his cans, marked P. R. R., and asked Prof. Newton what he supposed it had been adulterated with.

Prof. Newton—"Glass."

Mr. Crane said he wanted to speak in favor of the law. So far as he had heard, no one had been hurt by it, while it had done a great deal of good. The quality of milk sold in Newark had greatly improved since it had been in force. And what is now wanted is a more stringent law, even forbidding the sale of skimmed milk.

Prof. Newton said he thanked the gentleman for what he had said. It was rare that he heard a word of commendation.

Mr. James Neilson said he thought it would be a mistake to repeal the law. It operated in the interest of producer and consumer alike. It is a matter of life and death to thousands.

The essay on "Strawberry Culture," by Ezra C. Bell, which was read by Mr. P. T. Quinn, is printed in full in the report.

The following essays were ordered to be printed : "Potato Culture," Van Buren Griffen ; "Sweet Potatoes," A. P. Arnold.

The Secretary, Mr. P. T. Quinn, moved a vote of thanks to President Dudley, for the able, impartial and dignified manner in which he had discharged the duties of his onerous position. This was unanimously adopted. The meeting then adjourned, with a feeling that this was one of the best ever held by the State Board.

STATE
AGRICULTURAL SOCIETY.

ANNUAL MEETING

JANUARY 17th, 1883.

NEW JERSEY STATE AGRICULTURAL SOCIETY.

ORGANIZED 1855.

The annual meeting is held in the State House, at Trenton, on the third Wednesday in January, for the election of a full Board of Directors and officers. The annual exhibition will be held at Waverly, on September 17th, 18th, 19th, 20th and 21st, 1883.

The following officers were elected for 1883 :

PRESIDENT.

Hon. AMOS CLARK, Jr Elizabeth Union County.

VICE PRESIDENTS.

Gen. N. NORRIS HALSTEAD Newark Essex County.
Hon. PHINEAS JONES Newark Essex County.
Hon. N. S. RUE Cream Ridge Monmouth County.
Gen. JOHN S. IRICK Vincentown Burlington County.
E. G. BROWN Elizabeth Union County.

TREASURER.

SAMUEL MANNING Plainfield Union County.

RECORDING SECRETARY.

WM. M. FORCE Newark Essex County.

CORRESPONDING SECRETARY.

P. T. QUINN Newark Essex County.

BOARD OF DIRECTORS.

Hon. N. S. RUE Cream Ridge Monmouth County.
Col. WM. A. MORRELL Asbury Park Monmouth County.
WILLIAM M. FORCE Newark Essex County.
Gen. JOHN S. IRICK Vincentown Burlington County.
Col. ISAAC S. BUCKALEW Camden Camden County.
Dr. WM. A. CONOVER Hackettstown Warren County.
Gen. N. N. HALSTEAD Newark Essex County.
RICHARD THATCHER Flemington Hunterdon County.
Hon. AMOS CLARK, Jr Elizabeth Union County.
Hon. PHINEAS JONES Newark Essex County.
E. G. BROWN Elizabeth Union County.

P. T. QUINN	Newark.....	Essex County.
THOS. T. KINNEY.....	Newark.....	Essex County.
Hon. HENRY C. KELSEY.....	Trenton.....	Mercer County.
JOHN BOYLAN.....	Newark.....	Essex County.
WM. F. KIDDER.....	East Orange.....	Essex County.
A. D. NEWELL.....	New Brunswick.....	Middlesex County.
WM. MCKINLEY.....	Elizabeth.....	Union County.
A. V. SARGEANT.....	Newark.....	Essex County.
JOS. COLYER.....	Newark.....	Essex County.
Hon. GEO. A. HALSEY.....	Newark.....	Essex County.
JOHN I. HOLLY.....	Plainfield.....	Union County.
WM. S. TAYLOR.....	Burlington.....	Burlington County.
JOHN I. BISHOP.....	Columbus.....	Burlington County.
E. B. GADDIS.....	Newark.....	Essex County.
R. H. ALLEN.....	Milburn.....	Essex County.
Hon. THOS. H. DUDLEY.....	Camden.....	Camden County.
FERDINAND BLANKE.....	Linden.....	Union County.
MASON C. WELD.		

EXECUTIVE COMMITTEE.

E. G. BROWN.....	Elizabeth.....	Union County.
R. H. ALLEN.....	Milburn.....	Essex County.
E. B. GADDIS.....	Newark.....	Essex County.
JOS. COLYER.....	Newark.....	Essex County.
PHINEAS JONES.....	Newark.....	Essex County.

SECRETARY'S ANNUAL REPORT.

GENTLEMEN—The constitution of this Society has, among other provisions, that the Corresponding Secretary should, at the annual meeting of stockholders, held in Trenton on the third Wednesday in January of each year, present a report covering, in the main, the work accomplished by the Directors and Executive Committee for the past year. This I have endeavored to do, as briefly as possible, without doing injustice to the active workers of the Society—men, who have, year in and year out, applied themselves earnestly to carry out the spirit and intent of our charter, and, in doing so, promote and foster the agricultural interests of our State, an interest which all political economists admit to be the basis of wealth and prosperity. It is a good sign, and one that demonstrates the depth of State pride and generous interest in bettering the condition of their fellow-men, to witness how much voluntary labor is bestowed by our citizens in their effort to advance the art of agriculture.

The State Society has always been managed in the past, and it is

hoped it will be in the future, with a view to encourage, foster and promote those interests which furnish the bone and sinew of our yeomanry, and the wealth, peace and happiness of her citizens.

Agriculture is the art of cultivating the soil, which means, when practiced under the best forms, to get the largest returns at the least expense, and leave the soil in good condition for cropping in years to come. The endeavor to accomplish these ends has absorbed the best equipped brains, both in Europe and this country. The means of reaching these desirable results in this country, where land is comparatively cheap and generously fertile, with manual labor expensive—thirty to fifty per cent. higher than the same quality is in Europe—must, under existing circumstances, be largely directed towards achieving through the means of improved machinery and labor-saving in character.

To do this is one of the many aims our Society has always kept noticeably in plain view, and it has, without doubt, succeeded in a good impress on our farmers, for I find, in looking over the statistical returns of the national government, that there are only two other States which have more capital per head invested in farm implements and agricultural machinery, taking our population as a basis of computation, than our own State of New Jersey. This fact, I am inclined to believe, and, on logical grounds, is largely due to the efforts made by this Society to induce manufacturers of improved implements to exhibit their goods at our annual exhibitions, and, at the same time, offer flattering inducements to farmers to come there once a year and personally inspect these goods. The plan is a sensible one, and now, more than at any previous period, both parties, the manufacturer on one side, and the farmers on the other, realize the benefits accruing.

This feature is not confined to the farm implement and machinery department, but is applicable to every department of husbandry which is practiced in our State. There is one of these industries which our Society has not given the attention and encouragement to that its importance justly deserves, and its magnitude would warrant. This is the dairying interests of our State. The soil and climate of the northern and middle counties of our State are admirably adapted to the growth of the finest qualities of the nutritive grasses. With these in abundance, and a liberal supply of pure running streams, one has the first and important elements of producing the choicest grades of butter, an article always in demand, and commanding prices profitable to the

experienced dairy farmer. It is, however, a lamentable fact, that at least one-half by weight of the butter coming into market from New Jersey grades from medium to poor, and it is equally true that the cause of this deplorable condition of things comes from carelessness and ignorance in the case of the milk and making the butter.

To give some idea of the loss to the dairy farmers from this neglect, or lack of knowledge on the best methods of butter-making, I will state the fact, and know it to be so, that for the last eight months choice creamery and fancy dairy butter has ranged in prices from thirty-five to forty-five cents a pound wholesale, with an active demand at these prices. Now, on the other hand, the medium and poorer grades of butter have been dull, and they are dull to-day at from twenty-two to twenty-eight cents a pound. Now, it calls for no mathematician to demonstrate the loss to the producer accruing from this cause, which every sensible person knows has a remedy, and that remedy is to practice the best method of making butter. In time, there is no doubt, the establishment of more creameries in our State will, to a large degree, remedy this unfortunate and expensive practice of neglect on the part of so many slipshod dairymen.

The move made by our Society, prior to our last annual exhibition, of making a separate department for the exhibition of all modern dairy utensils, under the charge of a competent superintendent, is a move which is destined to accomplish good results, in a quarter where there is a wide field for improvement. It is to be hoped that our Society will enlarge this department another year, and offer liberal premiums as an inducement for manufacturers of these improved utensils to exhibit them on a larger scale.

There is another matter that at this time I desire to call your attention to; that is, getting horse railroad communication between Newark and the fair grounds. If this could be carried out it would bring in a steady and large source of revenue to the Society all through the summer and fall months. During these months there are three or four picnic parties each week from Newark which go to some of the suburban so-called parks, which, with horse railroad communication, would choose, without doubt, our grounds, because they are more spacious, and better adapted for the amusements and athletic sports. Even during our exhibitions such facilities would add largely to the number of our visitors. During the days of the annual exhibition, "all trains" on the Pennsylvania Railroad are advertised to

stop at Waverly, but the sad experience of many who had to wait for an hour or so at one of the depots will testify that all trains do not stop at Waverly station. I believe that an earnest effort on the part of the Directors, through the executive, would accomplish this very desirable result. The gains would be large enough to warrant the most strenuous effort. An effort should also be made to get the Pennsylvania Railroad to run a spur from the station to the grounds, where neat cattle and goods intended for exhibition could be loaded and unloaded inside of our own inclosure. Such a change would be appreciated by the exhibitors, especially to those bringing stock, neat cattle, sheep, swine and horses to the fair grounds. These are but a few of the matters which directly interest the annual receipts of the Society, and the sooner they are carried out the sooner will we reap the advantages in the form of larger returns to the stockholders.

Before taking up the routine of the year's work I wish to call the attention of the Society and stockholders to a subject which bears upon the future prosperity of our State. The areable surface of our State is comparatively small when compared with our neighbors on either side of us—New York and Pennsylvania. But, while deficient in surface, the quality of our farming land compares favorably with the best in the country. We are favorably located. Good home markets for our farm and garden products. Our rural population are above the average in intelligence; with good educational facilities; with a healthy climate, and plenty of pure water. Yet, notwithstanding all these inestimable advantages, nearly one-half of the areable surface is lying waste, producing nothing except an annual crop of arrears of taxes.

Good and improved farming land in some of the best agricultural counties can be bought for \$100, or less, per acre, and the unimproved at very much less. Yet, with all these facts before us, I know of no systematic effort which has been made on the part of State authorities, or any organized body, to encourage settlers to come to New Jersey to locate and buy improved, or take up and improve our waste land. Our Society could, without injury to themselves, do something towards that desirable end, and check, to some extent, the cry of "Go West." There are many a family who have gone "West" from our own State who wished themselves back when it was too late to carry out such a wish.

A month after the annual meeting, a year ago, the Board of

Directors met in Trenton, and elected the following officers and Executive Committee to serve for the year that has just closed :

Hon. AMOS CLARK, Jr.....	President.
Gen. N. N. HALSTEAD.....	Vice President.
Hon. PHINEAS JONES.....	Vice President.
Hon. N. S. RUE.....	Vice President.
Gen. J. S. IRICK.....	Vice President.
E. G. BROWN.....	Vice President.
P. T. QUINN.....	Corresponding Secretary.
WILLIAM M. FORCE.....	Recording Secretary.
SAMUEL MANNING.....	Treasurer.

EXECUTIVE COMMITTEE.

E. G. BROWN,
BENJAMIN HAINES,

R. H. ALLEN.

E. A. WILKINSON,
JOSEPH COLYER,

Soon after the election, the Executive Committee met at their office in Newark, and at that and two subsequent meetings plans were laid out for the year's work ahead. Mr. E. A. Wilkinson, who served on the committee for three years with faithfulness and fidelity, and with entire satisfaction to his associates, sent in his resignation, on account of a lack of time to attend to the duties, which, in the department of which he had charge, were very laborious. The committee regretted this step of Mr. Wilkinson's, and accepted the resignation, with the warm thanks of the Society for his valuable services while he held the position. Mr. E. B. Gaddis, of Newark, was unanimously elected to fill the vacancy in the committee, which he has done in the Speed Department with entire satisfaction to his associates, as well as to the exhibitors, although it is the most difficult department to manage.

One of the first questions that came up before the committee for their consideration, was that of closing all entries ten days before the opening of the fair. This plan had been tried with Department B—neat cattle, sheep and swine—the previous year, and it was found that the plan worked very well, giving the entry clerks an opportunity of making the entries and classifying them before the fair opened. After a thorough canvass of all the features of the matter, it was decided to adopt the same plan in all departments, with the exception of Departments C, D, E and K, representing “fruits, flowers and vegetables,” “needle-work and embroidery,” “bread and cake,” and “musical instruments and paintings,” etc., etc. It was thought best to leave

these four departments open until the second day of the fair. Notices to this effect were ordered sent to the addresses of all exhibitors whose names were found on our entry books. These notices were duplicated later in the season by postal cards, announcing that the entries would be closed in certain departments on the ninth of September, nine days before the opening of the fair.

The schedule of premiums was revised with great care, and an edition of 4,000 copies ordered printed, which cost the Society nothing. The half of this edition I mailed to the addresses of the most prominent farmers, horse and cattle breeders, manufacturers of agricultural tools and machinery. Early in May, I wrote to the secretary of every county and local society in the State, with the request that they would send me a list of the best and most active farmers, with their post office addresses. In this way we have compiled a total list of over 4,000 of the best farmers in the State. Later in the season, the balance of the premium lists were distributed by mail, where they were supposed they would do the most good. As soon as the lull of midsummer was over, active preparations were started, with vigor, by the Executive Committee to work every feature in every department of the Society. From the first of August, the committee met for business on an average of once a week. Several thousand hand-bills and large posters were printed and distributed throughout all parts of the State, by mail and special messengers, weeks in advance of the opening of the exhibition.

The annual collation to the "State Press" was given on the grounds on the 30th of August. This drew a larger number of the members of the press together than at any previous year, and there is no doubt that it was a profitable investment. The attendance at this re-union of representatives of the "Press" grows larger and more popular each succeeding year.

As announced in the premium list, the entry books were opened at the Society's office, 764 Broad street, Newark, one month in advance of the opening of the fair, under the superintendence of Mr. Benjamin Haines, who attended to all the details of this department. The Society always furnish hay and straw gratis for neat cattle during the fair, and, as an offset against this, the Executive Committee decided to charge one dollar a head as an entry fee. The plan met the approval of breeders, and I have no doubt this practice will be continued in the future. I believe it would have a good effect, and improve the quality of the exhibition, to charge a small entry fee in Department C, "fruits, flowers and vegetables," and Department D, "needle-work and

fancy goods." There are a great many inferior articles in these two departments brought for the only object of getting an exhibitors' ticket. This matter is likely to receive the attention of the Executive Committee before the next annual exhibition. While the Society can well afford to deal in a liberal spirit towards exhibitors, the too common practice of showing inferior articles, in order to get tickets, should be stopped.

The plan of closing the entry books in advance of opening the fair worked very satisfactorily, and will, in the future, work better when all the exhibitors realize how much easier it is to make the entries in a comfortable office in Newark, than it is in a crowd on the fair grounds, where one has to wait his turn for hours.

The following table gives the number of entries in each department, and the total number of entries each year since 1873.

DEPARTMENT.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
Special State.....	59	70	106	106	148	124	170	146	149	
Speed.....	84	52	98	105	99	98	149	103	126	
Department A.....	64	107	72	68	73	76	78	109	62	75
“ B.....	406	392	431	633	715	818	757	950	963	799
“ C.....	675	817	961	1,005	1,456	1,140	1,763	1,697	1,492	1,467
“ D.....	431	548	701	705	1,416	946	702	1,122	1,091	1,021
“ E.....	85	164	182	233	256	291	415	540	793	521
“ F.....	26	32	154	139	207	192	263	275	232	207
“ G.....	79	69	72	16	40	47	28	49	50	50
“ H }.....	73	29	52	36	37	.....	211	204	86	64
“ I }.....									121	83
“ K.....	45	97	114	115	136	214	142	177	183	255
“ L.....		81	97	88	140	159	15	34	72	77
“ M.....										35
Sweepstake “Cattle”.....										38
Total.....	1,968	2,447	3,004	3,249	4,681	4,129	4,687	5,491	5,394	4,967

In the neat cattle department the exhibition was, without question, the best ever held in this State. Among the exhibits there were eighteen herds of blooded stock, as follows:

JERSEY HERDS ON EXHIBITION—NINE.

OWNERS,

Hon. Thomas H. Dudley,
Wm. S. Taylor,
Geo. W. Farlee,
Davis Collomore,
John F. Maxwell,

J. W. Whitenack,
J. F. Satterthwaite,
J. Jay Bate,
C. F. Schoomaker.

HOLSTEIN HERDS ON EXHIBITION—FOUR.

OWNERS,

P. H. McAlpin,
James Neilson,Hon. A. S. Hewitt,
Wm. Hawkins.

AYRSHIRE HERDS ON EXHIBITION—FOUR.

OWNERS,

John Crane,
Wm. Lindsey,Robert Lindsey,
J. O. Magie.

SHORT HORNS ON EXHIBITION—ONE.

OWNER,

R. H. Allen.

GRADE HERDS—ONE.

OWNER,

R. Thatcher and Son.

In looking over the list of entries, there is a falling off last year of some four hundred from the previous year—that is, 1881. This falling off is confined principally to the poultry and bread and cake department. The superintendent of the poultry department informed me that all inferior birds were refused in that department, which accounts for the loss in numbers in poultry. In all the departments the standard of quality ranged high, and many excelled any previous exhibition. This was strikingly noticeable in the departments of neat cattle and horses. In these there was a very great improvement over previous years. There is no question but what every feature that would add to the value and usefulness of the exhibition of 1882 received from the Executive Committee and officers earnest attention, and at the same time every practical means were used to draw visitors to the fair, not only from our State, but from our neighboring States of New York and Pennsylvania. It was by far the best-planned and worked system, preparatory to the opening day, of any exhibition ever held by this Society. Nothing was overlooked that in the judgment of the officers and Executive Committee would add to its interest, make the exhibition of more value and increase the receipts.

On Monday, the 18th of last September, every sign was favorable of a clear week. Tuesday and Wednesday were excessively sultry, but clear. Up to this point the fair was a great success; but

Thursday, Friday and Saturday, the rain came down in torrents, and, as a matter of course, what two days before promised to be the best and most profitable, proved, from causes over which the officers have no control, to be otherwise; although, under the circumstances, every one was favorably surprised at the results, the details of which will be found in the Treasurer's report. Some were in favor of carrying the exhibition over another week, but wiser counsel prevailed. This plan has not proved successful with our Society. I did intend to call the attention of the stockholders to some needed improvements, in the way of better stables for horses, and more accommodations for neat cattle on the north side of the grounds, making show-rings for judging of stock in the well-shaded northeastern corner of the grounds. But owing to our present financial condition, these improvements have to go over for another year.

I need not assure you of the fact that we have at Waverly the most attractive, as well as grounds the best adapted for the purposes for which they are used of any in the country, and I firmly believe, with a judicious management, can be made profitable to the stockholders, and a means by which the condition of our agricultural resources can be vastly improved. In this special line there is still a wide field for improvement, both in legitimate farming, gardening and fruit-growing.

The special State premiums for farm and garden crops have every year since these premiums have been offered, fully demonstrated the fact that the soil under culture now in our State does not yield more than one-third of what it is capable of doing.

The average wheat yield in our State for the past year is thirteen and one-half bushels per acre, yet there are numerous instances the past year when over forty bushels per acre has been grown. The figures on Indian corn are more striking. The average yield of the State is about twenty-six bushels per acre, and yet we have instances after instances where verified statements show a yield of from ninety to 100 bushels of shelled corn to the acre, or four times the average yield of the State or the whole country. This is equally true of any other farm and garden crop raised in our State. The yield of corn in New Jersey for the year 1882 is estimated at 9,342,800 bushels. Suppose you estimate at twice instead of four times, and you would have 18,685,600, and this extra amount at seventy cents a bushel would make a difference of \$6,539,960.

The difference in wheat, oats, barley and potatoes would be even larger in proportion, bringing millions of dollars into the State, that is now lost through ignorance and poor culture. Before closing this brief outline of the year's doings, I would say to the stockholders that the Executive Committee deserve from your hands an earnest acknowledgment for the earnest and well-directed amount of labor they have done the past year, and if the weather had been favorable, the receipts would have been larger than at any previous fair.

TREASURER'S REPORT FOR YEAR 1882.

SAMUEL MANNING, *Treasurer*,

In account with NEW JERSEY STATE AGRICULTURAL SOCIETY,
From January 1st, 1882, to January 1st, 1883.

RECEIPTS.

To balance on hand January 1st, 1882..... \$36 49

GROUND ACCOUNT.

Cash received from W. P. D. Association, 1881	\$275 00	
" " " Rent of track.....	150 00	
" " " W. P. D. Association	375 00	
" " " Foot ball match.....	10 00	
		810 00

LOAN ACCOUNT.

Cash received for Loan First National Bank, Elizabeth..... 1,000 00

FAIR ACCOUNT.

Cash from Admissions.....	\$5,606 95	
" " Railroad Admission.....	3,878 25	
" " Grand Stand.....	309 00	
" " Special Privilege.....	1,100 00	
" " Stand Rents.....	3,773 00	
" " Entries—Speed.....	1,090 00	
" " " Special State.....	191 50	
" " " " Dept. B.....	67 00	
" " " Society, A.....	266 40	
" " " " B.....	124 00	
" " " Games.....	12 00	
" " Wm. M. Force.....	17 50	
" " Sales of Net and Balls.....	11 75	
" " Package Office.....	2 90	
" " Sweepstakes.....	7 00	
" " Discount on Medals.....	16 17	
		16,473 42
		\$18,319 91
Disbursement in excess.....		60 90
		\$18,380 81

DISBURSEMENTS.

GROUND ACCOUNT.

Cash, Haying.....	\$39 00	
" Settled Claim of 1831.....	50 00	
" Re-purchase of land.....	1,000 00	
" Examining Papers, &c.....	10 00	
" Miscellaneous Account.....	171 30	
" Supplies for Grounds.....	234 50	
" Ground Overseer.....	290 00	
		<hr/>
		\$1,794 80

GENERAL ACCOUNT.

Cash paid, Taxes on Lands, 1881.....	\$58 48	
" Fair Expenses 1881.....	47 50	
" Premium, 1881.....	19 00	
" Special State Premium.....	20 00	
" Rents.....	110 00	
" Stockholders' Meeting.....	6 00	
" Insurance.....	185 80	
" Printing Treasurer's Report, 1881.....	7 00	
" Interest Account.....	60 00	
" Directors' Dinners.....	62 00	
" Stockholders' Dinners.....	20 00	
" Taxes Clinton Township, 1882.....	302 00	
" Discounts.....	94 76	
" Salaries.....	1,400 00	
" Executive Committee Expenses.....	7 70	
" Secretary, Office Expenses.....	34 00	
" Treasurer, ".....	82 50	
		<hr/>
		2,516 74

LOAN ACCOUNT.

Cash paid First National Bank, Elizabeth.....	1,500 00
---	----------

IMPROVEMENT ACCOUNT.

Cash paid, New Buildings, &c.....	\$832 60	
" Cleaning Wells.....	75 25	
" Repairs, &c., pumps.....	80 00	
" Whitewashing.....	55 15	
		<hr/>
		1,043 00

FAIR EXPENSE ACCOUNT.

Cash, Expenses attending Fair.....	\$2,208 95
" Advertising.....	829 58
" Police.....	361 50
" Watchmen.....	173 62
" Printing Tickets, &c.....	87 85
" Refectory at the Fair.....	69 10
" Press Entertainment.....	96 00
" Recording Secretary, Superintendent and Clerks	448 63

Cash, Office Clerk at Newark.....	\$75 00	
" Treasurer's Ticket office and Gates help.....	174 43	
" Collecting Stand Rents	200 00	
" Membership to N. T. Association	56 00	
" Money refunded.....	9 75	
		<u>\$1,990 41</u>

PREMIUM ACCOUNT.

Cash paid, Speed.....	\$1,410 00	
" Society, Dept. A.....	719 90	
" " " B.....	2,001 50	
" " " C.....	736 00	
" " " D.....	319 25	
" " " E.....	107 50	
" " " F.....	165 00	
" " " H.....	6 00	
" " " J.....	11 00	
" " " K.....	87 00	
" " " M.....	57 00	
" Medals.....	384 25	
" Games.....	437 96	
" Diplomas, &c.....	93 50	
		<u>6,535 86</u>
		<u>\$18,380 81</u>

STATEMENT OF AWARDS OF STATE PREMIUM COMMITTEE ON FRUITS,
FIELD CROPS, &c., &c., FOR 1882.

VEGETABLES.

Henry Jeroleman, Hilton, N. J.	
First premium on one acre of potatoes.....	\$25 00
Henry Campbell, Freehold, N. J.	
Second premium on one acre of potatoes.....	15 00
Jesse L. Anderson, Camden, N. J.	
First premium on one acre of sweet potatoes.....	25 00
Henry Jeroleman, Hilton, N. J.	
First premium on one acre of tomatoes.....	15 00
Edmund Braddock, Medford, N. J.	
First premium on one acre of cabbages.....	25 00
A. & F. Sickles, Freehold, N. J.	
First premium on one acre of turnips.....	15 00
J. H. Clements, Merchantville, N. J.	
First premium on one acre of peppers.....	15 00
D. D. Denise, Freehold, N. J.	
First premium on one-quarter acre of carrots.....	15 00
Wm. Vreeland, Danville, N. J.	
First premium on one-quarter acre of onions.....	15 00
John H. Cooper, Pompton Plains, N. J.	
Second premium on one-quarter acre of onions.....	10 00

FRUIT.

Joseph Bradbury, South Orange, N. J.	
First premium on three-quarters acre of grapes.....	\$30 00
Henry Jeroleman, Hilton, N. J.	
Second premium on one acre of grapes.....	20 00
Henry Campbell, Freehold, N. J.	
First premium on one acre of blackberries.....	30 00
Henry Campbell, Freehold, N. J.	
First premium on one acre of strawberries.....	30 00
Wm. R. Ward, Newark, N. J.	
Second premium on one acre of strawberries.....	20 00
John S. Denise, Freehold, N. J.	
First premium on one acre of peaches.....	30 00
Wm. R. Ward, Newark, N. J.	
First premium on one acre of currants.....	30 00

FIELD CROPS.

R. Thatcher, Flemington, N. J.	
First premium on five acres of oats.....	25 00
Henry Campbell, Freehold, N. J.	
First premium on five acres of wheat.....	25 00
D. Aug. Vandever, Manalapan, N. J.	
First premium on five acres clover hay.....	25 00
Wm. Vreeland, Danville, N. J.	
First premium on five acres of timothy hay.....	25 00

YIELD PER ACRE, ON PREMIUM CROPS OF 1882, WAS AS FOLLOWS:

	YIELD.	RECEIPTS.
POTATOES.		
1 acre, Henry Jeroleman, Hilton, N. J.....	322 bushels.	\$379 54
“ Henry Campbell, Freehold, N. J.....	300 bushels.	355 00
SWEET POTATOES.		
1 acre, Jesse L. Anderson.....	672 baskets.	.....
TOMATOES.		
1 acre, Henry Jeroleman.....	160 bushels.	147 57
CABBAGES.		
1 acre, Edmund Braddock.....	4,000 heads.	210 00
TURNIPS.		
1 acre, A. & F. Sickles.....	125 barrels.	.....
PEPPERS.		
1 acre, J. H. Clements.....	1,271 bushels.	.....
CARROTS.		
$\frac{1}{4}$ acre, D. D. Denise.....	202 bushels.	.....
ONIONS.		
$\frac{1}{4}$ acre, Wm. Vreeland.....	220 bushels.	.....
“ J. H. Cooper.....	192 bushels.	.....
GRAPES.		
$\frac{3}{4}$ acre, Jos. Bradbury.....	15,466 pounds.	687 71
1 “ Henry Jeroleman.....	16,555 pounds.	618 10
BLACKBERRIES.		
1 acre, Henry Campbell.....	320 bushels.	614 40
STRAWBERRIES.		
1 acre, Henry Campbell.....	8,704 quarts, @ 10c.	870 40
“ Wm. R. Ward.....	3,169 quarts, @ 18c.	570 42
PEACHES.		
1 acre, John S. Denise.....	1,286 baskets.	.....
CURRANTS.		
1 acre, Wm. R. Ward.....	246 bushels.	518 39
OATS.		
5 acres, R. Thatcher.....	291 bushels.	.....
WHEAT.		
5 acres, Henry Campbell.....	46 $\frac{4}{11}$ bush. per acre.	.....
CLOVER HAY.		
5 acres, D. A. Vandev eer.....	20 $\frac{1175}{2000}$ tons.	.....
TIMOTHY HAY.		
5 acres, Wm. Vreeland.....	15 $\frac{517}{2000}$ tons.	.....

AMERICAN CRANBERRY GROWERS' ASSOCIATION,

FORMERLY THE

NEW JERSEY CRANBERRY GROWERS' ASSOCIATION.

ANNUAL MEETING HELD IN THE STATE HOUSE, TRENTON,
JANUARY 16TH, 1883.



OFFICERS FOR 1883.

PRESIDENT.

Dr. J. H. BRAKELEY.....Bordentown.....Burlington County.

VICE PRESIDENTS.

Hon. THEODORE BUDD.....Pemberton.....Burlington County.

Dr. E. S. MERRIMAN.....Lakewood.....Ocean County.

SECRETARY AND TREASURER.

Hon. A. J. RIDER.....Trenton.....Mercer County.

STATISTICIAN.

N. R. FRENCH.....Elizabeth.....Union County.

EXECUTIVE COMMITTEE.

J. H. BRAKELEY.....Bordentown.....Burlington County.

A. J. RIDER.....Trenton.....Mercer County.

E. W. CRANE.....Caldwell.....Essex County.

N. R. FRENCH.....Elizabeth.....Union County.

CORRESPONDING SECRETARIES FOR NEW JERSEY.

M. M. CHEW.....Williamstown.....Gloucester County.

CHAS. L. HOLMAN.....Lakewood.....Ocean County.

Dr. L. W. BROWN.....Vineland.....Cumberland County.

ALFRED SATTERTHWAITE.....Crosswicks.....Burlington County.

WM. QUICKSALL.....Hornerstown.....Ocean County.

CORRESPONDING SECRETARIES FOR MASSACHUSETTS.

ISAAC ALGER.....Attleboro.....Massachusetts.

O. M. HOLMES.....Boston (box 5,223).....Massachusetts.

CORRESPONDING SECRETARY FOR CONNECTICUT.

D. C. SPENCER.....Old Saybrook.....Connecticut.

CORRESPONDING SECRETARY FOR RHODE ISLAND.

A. C. SAMPSON.....15 Weybosset Street.....Providence, R. I.

CORRESPONDING SECRETARY FOR LONG ISLAND.

WM. JAGGERS.....Jericho.....Long Island, N. Y.

COMMITTEES FOR 1883.

Standard Measure—Staniford, Crane, Rider, Satterthwaite, Collings and Chew.

Foreign Trade—Crane, French, Rider.

Scientific Investigations—Brakeley (J. H.), Dr. Goodell, Prof. George H. Cook.

Insects—Brakeley (J. H.), Holman, Applegate.

OFFICIAL PROCEEDINGS.

The annual meeting of the New Jersey Cranberry Growers' Association was held at the State House, Trenton, New Jersey, January 16th, 1883, at 11 o'clock, with the President, Dr. J. H. Brakeley, in the chair.

The reading of the minutes of the last annual meeting and convention being dispensed with, N. R. French, Esq., Statistician of the association, read the following:

STATISTICAL REPORT.

In my report to the meeting at Lakewood, on the 29th of August last, I estimated the crop of cranberries then on the vines at two-thirds in New Jersey and three-fourths in New England of the crops of the previous year.

The Western crop was set down the same as in 1881. All these estimates have proved unusually wide of the actual result.

From New Jersey I have forty-three reports—apparently well distributed over the cranberry sections of the State—each giving the actual crop of 1881 and 1882. Six of these reports foot up 4,578 bushels in 1881, and 8,020 in 1882—a gain of seventy-five per cent.

The remaining thirty-seven reports foot up 44,432 in 1881, and 16,677 in 1882—a loss of sixty-two per cent.

The entire forty-three reports are, therefore, 49,010 in 1881, and 24,697 in 1882—a falling off of fifty per cent., or one-half. The crop of 1881 being set down at 157,014 bushels, that of 1882 would be 78,507.

The movement of the New Jersey crop, actual and estimated, has been as follows, from commencement of season until December 30th, 1882:

TO NEW YORK.

By N. J. S. Railroad, 7,526 crates, 6 bbls.—7,544 bushels ; against 22,566 bushels to same time in 1881.

By Pennsylvania Railroad, 1,869 crates, 134 bbls.—2,271 bushels ; against 9,081 bushels for corresponding time in 1881.

By ferries, from Jersey City, say 4,000 crates ; against 5,000 crates in 1881.

Total to New York, 13,815 bushels ; against 36,647 bushels in 1881.

TO PHILADELPHIA.

By Camden and Atlantic Railroad, 15,838 crates, 261 bbls.—16,621 bushels ; against 25,016 bushels in 1881.

By Pennsylvania Railroad, Amboy Division, 6,173 crates, 911 bbls.—8,906 bushels ; against 18,252 bushels in 1881.

By West Jersey Railroad, 1,582 crates, 470 bbls.—2,992 bushels ; against 9,257 bushels in 1881.

By ferries, from Camden, say 3,000 bushels ; against 5,000 bushels in 1881.

Total, 31,519 bushels ; against 57,525 bushels in 1881.

To the West, direct, say 15,000 bushels ; against 30,000 bushels in 1881.

To home markets, say 4,000 bushels ; against 7,000 bushels in 1881.

This shows a movement of the New Jersey crop amounting to 64,334 bushels ; against 131,172 bushels for same time in 1881.

Deducting the amount thus shown to have been moved from the entire crop, as calculated from the crop returns, there appears to be still in the hands of growers, 14,173 bushels. This may be about right, but I can't see where so much can be located.

It is, to be sure, a very light stock, but my advices have led me to expect still less.

From New England I have forty-five crop reports stating amounts gathered in 1881 and 1882. Nineteen of these reports foot up, respectively, in bushels, 8,224 and 27,924—a gain in 1882 of 240 per cent. Twenty-six reports foot up 25,166 and 13,271—a loss in 1882 of forty-seven per cent. These figures make the forty-five reports

show 33,390 and 41,195—a gain on the whole, in 1882, of twenty-three per cent. This gain, added to the 155,825 bushels set down as the crop of 1881, makes the New England crop of 1882, 191,664 bushels.

The movement of the New England crop, actual and estimated, from commencement of season to December 30th, 1882, has been as follows:

TO NEW YORK.

By Fall River line—bringing most of the Cape Cod cranberries—13,834 boxes, 15,705 bbls.—60,949 bushels; against 53,472 bushels in 1881.

I have no records from the Norwich, Stonington, Providence, New Bedford, and New Haven lines, all of which bring cranberries from New England to New York. All these, with some by sail vessels, probably, brought one-half as much as the Fall River line, making the entire receipts, say 91,500 bushels, against 75,000 bushels in 1881.

TO BOSTON.

By Old Colony Railroad, 2,542 boxes, 9,266 bbls.—30,340 bushels.

By other roads, say 10,000 bushels.

In all, to Boston, 40,340 bushels.

To the West, from country stations, direct, say 8,000 bushels.

To Philadelphia, from Fall River, direct, say 10,000 bushels.

To Providence and other New England cities, direct, say 10,000 bushels.

These items show a movement of the New England crop amounting to 159,840 bushels, which, taken from the entire crop, as above calculated, leaves 31,824 bushels still in the hands of growers on the 30th of December, 1882.

The Cape Cod crop, as the season progressed, was seen to be decidedly larger than early reports indicated.

The yield in East Dennis, Harwich, Cotuit and Mashpie equalled or exceeded that of the previous year. The large marshes at Marston's Mills, West Sandwich and in Plymouth county had crops far in excess of the previous year. The interior section, embracing Holliston, Franklin, Foxboro, and contiguous towns had good crops, much exceeding those of 1881.

Notwithstanding these favored localities, the area of comparative failure is so large, embracing interior sections represented by the shipping stations of Uxbridge, Waterford, Attleboro, Taunton and Rock, in Massachusetts, and West Kingston, Rhode Island, and many points on the Cape and adjacent islands, that I can hardly credit the amount apparent from the forty-five crop reports. They seem to be sufficiently numerous and well distributed to fairly represent the general yield, but chance may have thrown in too many of the largely favored crops. The quantity apparently on hand in New England also staggers me. I cannot believe there are now near 32,000 bushels in the hands of New England growers.

I believe Long Island is now the only cranberry-producing section in the State of New York. The crop there has been very light, and, notwithstanding a good first-yield upon some new acreage, the whole production will not exceed 2,000 bushels, against 5,000 bushels in 1881.

The Western crop of the last season now appears to have been only about one-third of that of 1881, say 50,000 bushels, instead of equaling it, as at first estimated.

The entire crop of 1882, as above shown, is as follows, in bushels :

New Jersey	78,507
New England	191,664
New York	2,000
Western States	50,000
Total	322,171

Against 461,025 bushels in 1881—a falling off of thirty per cent.

THE COURSE OF TRADE.

At the commencement of the season, it was clearly understood that the apple and cranberry crops of the country were both very short. Cranberries came to market later than in the two preceding years. Very little was done in September. For choice to extra New Jersey fruit, in standard crates, the opening prices in New York and Philadelphia were about \$2.75 to \$3. Extra to fancy early blacks, from Cape Cod, brought at the same time \$9 to \$10 per barrel, and occupied the early market so fully that Jersey crates were nearly excluded.

Inferior fruit, of course, sold much lower, but its relative quantity was smaller than in previous years.

These opening prices are much higher than has before occurred since 1876, when the crop was the smallest on record; but they have been remarkably well sustained.

No serious reactions have occurred. Gradually advancing rates prevailed until, in December, \$4.25 to \$4.50 was reached for extra Jersey crates, and \$14 to \$15 per barrel for extra to fancy New England fruit.

Since, and, indeed, during the holidays, the demand has been very light, with sales probably less than the receipts.

But small stocks on the New York market, and the general belief that only trifling amounts remain in the country, have served to keep prices steady. If, however, the calculations herewith fairly represent the quantities in reserve, prices have, probably, reached the maximum, and may soon begin to recede.

In any event, the encouraging fact remains, that the bulk of a crop, only about one-third less than the unprecedented crops of 1880 and 1881, has been sold at such high prices.

I am told, that on Cape Cod the success of the last few years has set on foot much new planting. In New Jersey, I believe, the new planting has, of late years, been less than the lapsing of old bogs into utter unproductiveness.

The export trade in cranberries has, this season, been a mere trifle. Only about 400 crates have gone across the water from New York. Prices have been too high.

STANDARD MEASURE.

I should be very glad if the package question could be finally adjusted and put to rest. It has fallen to my lot to present its varying phases in these reports.

The cranberry barrel of Massachusetts is required, by law, to hold not less than 100 quarts, dry measure. Crates or boxes are of comparatively recent introduction there, and the size is not yet legally prescribed.

There is the same irregularity in size that originally prevailed in New Jersey, except that none of them are too large.

The New Jersey barrel was originally faithfully copied from the

Cape Cod, and its legal size does not exceed the present legal and prevalent size of Massachusetts.

The New Jersey standard crate is of convenient and symmetrical shape, and holds just one-third of the legal barrel. Both conform fairly to other legal standards—the crate, when *tight* packed, holding two moderately rounded half-bushels, and the barrel just three times as much.

These sizes were instituted by this Association ten years ago. They were soon adopted and followed by a large majority of the cranberry growers of this State.

Some had previously used a crate decidedly larger than the size finally settled upon. All of these, I believe, with the exception of Mr. D. R. Gowdy, willingly came down to the standard.

A good many of these extra-large crates were on hand when the Association decided upon the smaller size for a standard. They were afterwards, several times, thrust upon me, well filled, in the way of trade, by their economical owners. Considering the fix they were in, I did not object.

On the other hand, some of the small crate men not only used up their stocks of undersized crates, but continued them.

The small-measure men were very radical in their notions of personal rights. They thought uniformity of size and an established standard all right for those that preferred it; but if they could do better by imitating the appearance of the standard, while scanting the measure, they thought themselves entitled to the benefit of such shrewdness.

The standard-measure men soon perceived that either themselves or the public, or both, were losing whatever the small-measure folks gained.

Since the crate-makers charged the same for the small as for the standard size, and the freights to market were the same, the only advantage possible in their use was the chance of their passing unnoticed at the current price of standard crates, to the direct loss of the purchaser; or, when the market was dull, to attract the unwary by apparently lower prices, to the direct detriment of trade in the standard sizes.

This prompted the enactment of the standard-measure law, which was intended to enforce uniformity in the size of packages. It was passed at the instance of this Association, and substantially in the

form that we recommended. I accept my full share of responsibility for the inefficient results of our amateur law-making. I have now a broader charity for our servants in the Legislature, whose bungling work so often calls for sharp rebuke.

With some doubts about constitutional limitations, and in consideration of the stock of small crates then on hand, we undertook, by very nice and rather intricate provision, to permit the use of the small crates already made, by marking thereon their actual size, as compared with the standard. This requirement upon all undersized crates, it was supposed, would prevent their further manufacture. The marking prescribed, proved, in its meaning and object, not clear and apparent to the general trade, and it was often, in part, evaded, rendering the balance of no significance whatever.

The small-measure nuisance, therefore, continues, and is protected by the law that was intended for its suppression.

I am decidedly of the opinion that no change in the New Jersey standard can be advantageously made. It is widely known and appreciated. The trade in fresh fruits and vegetables has recently been organized in the Mercantile Exchange, New York. Grades have been there established for cranberries, and the New Jersey standard packages recognized as binding in transactions between the members of the Exchange. But I could tolerate any moderate or reasonable change in the standard, provided uniformity could thereby be secured.

The experience of the last few years, and the light thrown upon this question by the various discussions, lead me to think that the true and equitable interests of cranberry growers would be greatly promoted by the passage of a simple and brief law, affirming the present standard and prohibiting all inferior sizes, under proper penalties, and with adequate provision for enforcement.

I hope that experience has now brought us to such unity of sentiment that we may with propriety ask for such a law.

I have dwelt upon this topic beyond my first intention, and, perhaps, beyond your patience.

If this be so, and no action seems wise or practicable, I will not be likely to tax myself or weary you in this way again.

CRANBERRY BULLETIN.

In accordance with the action of the last Convention, a Weekly Bulletin has been issued to such members of the Association as subscribed therefor. Of its value, in its present limited and imperfect shape, the subscribers can best testify. I have a realizing sense of the labor and care involved in its starting and conduct thus far. Its continuance, after this season, is a question which, perhaps, need not now be considered. The expense incurred for obtaining the New York receipts, may be avoided next season, by getting them,—and more completely—through the Mercantile Exchange, which will include cranberries in its list of daily receipts, for the benefit of the fresh fruits and vegetables organizations before alluded to. There are indications of such organizations to follow, in Philadelphia, Boston and Chicago. When these are perfected, the daily and weekly movement in cranberries may be more fully shown, and with less expense. The information upon prospective, or actual crops, can be most effectually obtained direct from the growers. The greater the number, and the wider the field covered by these crop reports, the more accurate and valuable the information drawn from them becomes. The extension of the membership of the Association to other States is a direct help to this end, and some further recognition of this outside membership may, perhaps, be wisely considered at the present time.

TABLES.

The estimates of the cranberry crop of the country, for ten years, are shown in the following table, in bushels:

	1872.	1873.	1874.	1875.	1876.
New England.....	40,000	105,000	105,000	75,000	65,000
New Jersey.....	100,000	110,000	90,000	110,000	90,000
Western States.....	135,000	60,000	50,000	40,000	40,000
New York.....			5,000	5,000	3,000
Totals.....	275,000	275,000	250,000	230,000	198,000

	1877.	1878.	1879.	1880.	1881.	1882.
New England.....	164,229	125,000	165,000	247,500	155,825	191,664
New Jersey.....	152,100	60,000	90,000	128,700	157,014	78 507
Western States.....	79,500	107,769	75,000	113,430	143,186	50,000
New York.....	5,000	3,000	3,000	3,000	5,000	2,000
Totals.....	400,828	295,769	233,000	492,630	461,025	322,171

A table showing the opening and closing prices of cranberries in bushel crates, at New York, for twelve consecutive seasons, commencing with 1870:

1870. September.....	\$3 50 @ 4 00
May, '71.....	1 00 @ 1 25
1871. September.....	3 25 @ 4 00
May, '72.....	4 50 @ 5 50
1872. September.....	3 25 @ 4 00
May, '73.....	1 50 @ 2 00
1873. September.....	2 50 @ 3 00
April, '74.....	4 75 @ 5 00
1874. September.....	2 75 @ 3 00
May, '75.....	1 75 @ 2 00
1875. September.....	2 00 @ 2 75
May, '76.....	4 75 @ 5 00
1876. September.....	3 25 @ 3 50
May, '77.....	2 00 nom.
1877. September.....	2 00 @ 2 50
May, '78.....	4 00
1878. September.....	2 00 @ 2 25
May, '79.....	2 25 @ 2 50
1879. September.....	1 75 @ 2 00
May, '80.....	5 00 @ 6 00
1880. September.....	1 50 @ 2 00
May, '81.....	50 @ 1 00
1881. September.....	1 50 @ 2 00
January, '82.....	3 50 @ 4 00
May, '82.....	2 00 @ 3 00
1882. October 1st.....	2 75 @ 3 00
January 1st, 1883.....	4 00 @ 4 50

PACKAGES.

The following sizes are established by law in New Jersey:

BOXES OR CRATES.

Bushel.....	8 $\frac{3}{4}$ x 12 x 22 inches	} inside measure.
Peck.....	8 $\frac{3}{4}$ x 6 x 11 inches	

BARRELS.

Depth.....	25 $\frac{3}{8}$ inches	} inside measure.
Diameter Head.....	16 $\frac{1}{2}$ inches	
Diameter Bilge.....	18 $\frac{3}{4}$ inches	

The law of Massachusetts requires the cranberry barrel to hold 100 quarts, dry measure, which is practically the same as the New Jersey legal barrel.

Three New Jersey crates equal a barrel, but the Cape Cod boxes are five to ten per cent. smaller.

N. R. FRENCH.

January 15th, 1883.

Accepted with thanks.

REPORTS OF COMMITTEES.

Standard Measure—No report. (See Statistical report, and discussion later.)

Foreign Trade—No report. (See Statistical report.)

Scientific Investigations—Dr. Brakeley, chairman, made a short report in regard to experiments with "*poison*" (copperas) *marl*. It was found to improve the growth and appearance of the vines, but no difference was noticed in the "scalding" of the fruit.

Insects—A verbal report was made by Dr. Brakeley, chairman, and a discussion followed. Dr. Brakeley said, that from observations made for several years past, he concluded that many cranberry plantations suffered from an insect not hitherto noticed or described. Frequently he had seen the terminal leaf of a plant eaten, but had set it down as the work of the ordinary vine-worm. Last year, however, he noticed it in several places where the vine-worm did not occur, and, as in those places the vines produced little or no fruit, he thought it highly probable that the buds had been injured by an insect so small as to escape observation. It might prove to be the tip-worm of New England. He suggested that careful observations be made the coming season, beginning a week or ten days after the water is drawn off; and, if the presence of an enemy is detected, it might be attacked with *white hellebore*, in the same manner that florists destroy slugs on rose-bushes.

Mr. Davidson gave a description of an insect which had destroyed the entire crop of berries on his forty-acre plantation, from which he gathered 6,000 bushels of berries year before last. The insect, he said, looked like a fly, and was of about half the size of an ordinary house-fly; but, when caught, however, he found it to be a moth, and not a fly. This little insect made its appearance on his bog in countless millions, eating the leaves and blossoms, and giving the vines the appearance of having been scorched by fire. He saw no worms, and

supposed that the work of destruction had been effected by these little moths.

Mr. Satterthwaite also described the complete destruction of the fruit on a bog of his, of the same size as that of Mr. Davidson. He had discovered, however, that the agent of destruction was a small worm, and not a moth, as Mr. Davidson supposed.

Dr. Brakeley remarked, that from the descriptions given, there could be no question but that the insect referred to was the *Gelechia*, or *new vine-worm*, the habits of which he had carefully studied for the past five years; that Mr. S. was correct in attributing the destruction to a worm, and that what Mr. D. saw was this parent-moth, into which the worms which had destroyed his fruit had been transformed. Dr. Brakeley also added, that he had been entirely successful in checking the ravages of this most formidable pest on his Lahaway plantation. He then briefly described the method he had followed, as detailed at length in the reports of this Association for the years 1879 and 1880. If these directions were carefully followed, he thought there would be no difficulty in protecting their bogs from this destroyer. This new vine-worm is, evidently, spreading to portions of the cranberry territory where it had been unknown heretofore. When few in number, they are unnoticed; but, when a season comes which is specially favorable to the development of insect life, they so multiply as to sweep over an entire bog. They, doubtless, had been on Mr. D.'s bog before last year, but not in sufficient numbers to attract attention. Had his bog been carefully examined early in the preceding August, they would have been discovered, as that is the time when the moths had deposited the eggs, from which the worms were hatched the following spring, which proved so destructive. These eggs are of a yellowish, waxy appearance, and are placed on the under side of the leaf, usually separately, but sometimes two or three on the same leaf. Being surrounded by a mucilage, which is impervious to water, flowing a bog does not protect it. Where the first brood of worms, which comes out in May, is not sufficiently numerous to destroy all the leaves, the second one, which hatches out early in July, and is increased probably twenty-fold, is pretty certain to finish the work.

The Treasurer's report for the year ending January 16th, 1883, was then read.

RECEIPTS.

Received for dues and membership fees.....	\$84 00
Received on account of Special Bulletin Fund.....	33 00
Total cash receipts.....	———— \$117 00
Balance from last report.....	31 79
Total.....	———— \$148 79

DISBURSEMENTS.

Paid on account of statistics.....	\$30 00
Paid expenses of printing reports, notices, copyright, fees, postage, etc..	62 95
Total.....	———— \$92 95
Balance on hand.....	\$55 84

A letter from Mr. J. J. White, asking permission to use the copyright publications of the Association in a revision of his work on Cranberry Culture, was then discussed. It was resolved that, as the Association is considering the propriety of revising and republishing this matter, it would not be advisable at present to grant the request.

A report from the Secretary showed the membership of the Association to be 127, and distributed as follows:

New Jersey, 64; Massachusetts, 16; New York, 13; Pennsylvania, 9; Connecticut, 7; Maine, 3; Rhode Island, 3; Wisconsin, 2; Missouri, 2; Minnesota, 1; Florida, 1; Illinois, 1; Dakota, 1; Michigan, 1; Washington, D. C., 2; Nebraska, 1.

Mr. French then made some remarks in regard to the growth of the Association, particularly as shown in the membership from other sections, and to the results that might be attained by making it still more liberal and comprehensive; and moved that in order thus to extend its usefulness, its name be changed to the "American Cranberry Association."

Mr. Budd moved to amend by making it "American Cranberry Growers' Association."

The motion, as amended, was then carried.

On motion, Section 3 of the By-Laws, which reads as follows: "3. It shall be in the discretion of the Executive Committee to make an assessment on the members for the purpose of defraying the expenses incurred in enlarging the market for this fruit, and other needful purposes, not to exceed one cent for each bushel of berries grown," was stricken out, and the Secretary was authorized to change the phraseology of the Constitution and By-Laws to conform with

the new name and character of the Association, and publish the same thus changed in connection with the report of this meeting.

The subject of Standard Measure was discussed at considerable length.

Hon. Theo. Budd referred to the now well known practice of some cranberry dealers in the cities of New York, Philadelphia and Chicago, of transferring cranberries from the Standard Packages, in which New Jersey growers are required, by law, to ship their fruit, to "*pony*" packages, not only to the great detriment of honest growers, who comply with the law, but to the unfair advantage of themselves, as well as those growers who by any means evade the law.

Ex-Senator Havens and others also feelingly alluded to the same difficulty, and to that of successfully carrying out the *spirit* of our N. J. Standard Measure law, while the bulk of our fruit is sold in other States. °

It being stated that the *Mercantile Exchange* of New York City had already adopted the N. J. Standard Cranberry Package sizes, and that through its Fresh Fruits and Vegetables Committee it was agitating the subject of legislation on the various fruit packages, it was moved and carried that Mr. French be appointed as a Special Committee to confer with the above organization in regard to having our standard sizes established by law in New York and other States.

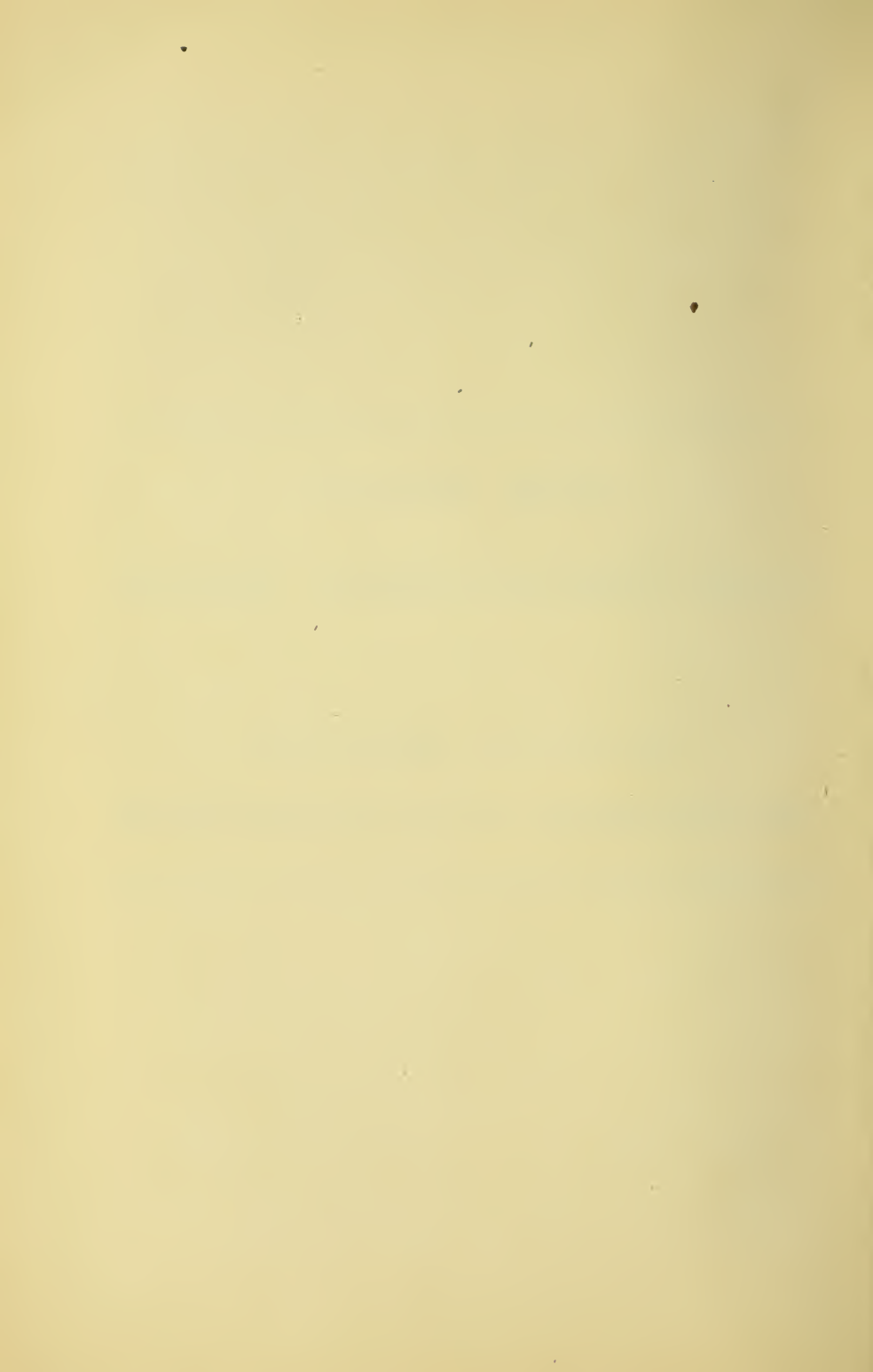
A. J. RIDER,

Secretary.

NEW JERSEY
STATE HORTICULTURAL SOCIETY.

ANNUAL MEETING

Held at Freehold, Monmouth Co., New Jersey, January 9th and 10th, 1883.



OFFICERS FOR 1883.

PRESIDENT.

WILLIAM R. WARD.....Newark.....Essex County.

VICE PRESIDENTS.

E. S. CARMAN.....	River Edge.....	Bergen County.
J. S. REDFIELD.....	Burlington.....	Burlington County.
EZRA STOKES.....	Berlin.....	Camden County.
THEO. F. BAKER.....	Bridgeton.....	Cumberland County.
WM. H. GOLDSMITH.....	Newark.....	Essex County.
J. G. WHITALL.....	Woodbury.....	Gloucester County.
C. W. IDELL.....	Hoboken.....	Hudson County.
E. P. TOMLINSON.....	Stockton.....	Hunterdon County.
EDWIN ALLEN.....	New Brunswick.....	Middlesex County.
JAMES VAN DEVENTER.....	Princeton.....	Mercer County.
JOHN S. GREEN.....	Morristown.....	Morris County.
D. A. VANDEVEER.....	Manalapan.....	Monmouth County.
JESSE BATTEY.....	Manchester.....	Ocean County.
GEO. C. WOOLSON.....	Passaic.....	Passaic County.
D. C. VOORHEES.....	Blawenburg.....	Somerset County.
E. P. BEEBE.....	Elizabeth.....	Union County.

RECORDING SECRETARY.

E. WILLIAMS.....Montclair.....Essex County.

CORRESPONDING SECRETARY.

J. T. LOVETT.....Little Silver.....Monmouth County.

TREASURER.

CHAS. L. JONES.....Newark.....Essex County.

EXECUTIVE COMMITTEE.

J. B. WARD.....	Newark.....	Essex County.
C. W. IDELL.....	Hoboken.....	Hudson County.
J. S. COLLINS.....	Moorestown.....	Burlington County.
E. P. BEEBE.....	Elizabeth.....	Union County.
HENRY CAMPBELL.....	Freehold.....	Monmouth County.

FRUIT COMMITTEE.

J. B. ROGERS.....	Milburn.....	Essex County.
JOHN R. PARRY.....	Parry.....	Burlington County.
CHAS. L. JONES.....	Newark.....	Essex County.
A. W. PEARSON.....	Vineland.....	Cumberland County.
D. A. VANDEVEER.....	Manalapan.....	Monmouth County.

FLOWER COMMITTEE.

GEO. C. WOOLSON.....	Passaic.....	Passaic County.
JAS. TAPLIN.....	Maywood.....	Bergen County.
J. B. WARD.....	Newark.....	Essex County.

VEGETABLE COMMITTEE.

EDWIN BEEKMAN.....	Middletown.....	Monmouth County.
S. C. DE COU.....	Moorestown.....	Burlington County.
THEO. F. BAKER.....	Bridgeton.....	Cumberland County.

NEW JERSEY STATE HORTICULTURAL SOCIETY.

The eighth annual meeting was held at Freehold, Monmouth county, New Jersey, January 9th and 10th, 1883. We never presented a more interesting or instructive programme, yet the farmers and residents of the county failed to attend in any considerable number.

The *planting of waste places with trees for timber* was advocated; catalpa, ailantus, yellow locust, chestnut and black walnut were named as most desirable for this purpose. The durability of locust was cited by one speaker who has posts that were set in his grandfather's day, and how long they have been standing no one knows; have been reset several times, and are still sound. Another has posts holed by his father eighty years ago; have been in the ground ever since, and are still sound; and he knew of a sassafras stump yet sound, though the tree was cut 100 years ago. A paper on *floriculture for the young*, advocated setting apart a plot of ground, furnishing seeds, and directing the work which the children are to perform, thus creating and developing in them a love for the beautiful and good. A little praise judiciously bestowed is often beneficial. An instance was given of a school incited by the offer of seeds by Mr. Wanamaker, of Philadelphia, planted and cared for, and an exhibition held in the autumn that put to shame many an organized society. A plan of this kind introduced in any school district of the county cannot fail of beneficent effect. Of *quinces* the pear variety is considered best; the apple quince does not produce so much, though as well cared for. Salt and lime were named as special fertilizers for this fruit. Borers and fungus are formidable enemies.

Requisites for success with *asparagus* are: Large size of shoots, green color and proper method of putting up, extra fine bringing \$9; prime, \$4, and culls \$2 per dozen bunches. As to product, three cases were given, the first 1,670 bunches per acre, \$331; another, 1,540 bunches

per acre, \$317; next, a light blowing sand, 1,470 bunches, \$285. A ton of salt per acre was used; a piece left without salt, then half a ton used, then none, then one-fourth of a ton, and no difference could be seen save in color, probably due to the larger quantity attracting more moisture. Plants should be set two and half feet by five feet, and six inches below the surface. There is but little difference in varieties as to profit; Connover's Colossal is generally planted, and Long Island Purpletop some growers still consider good as any. High manuring to secure large stalks, and putting on the market in an attractive shape, are the important factors for success.

Of *grapes*, Early Dawn mildews badly with some and not with others; quality very good. Wyoming Red, early, apt to overbear, very-foxy; Brighton still maintains a high reputation as one of the best; Lady Washington is promising generally so far as tried; Early Victor, three or four days later than Moore's; flavor pure and very good. Niagara is on trial by several members, and though somewhat affected with mildew, as most all others were the past season, no sight of rot has yet appeared, and the fruit is much finer in color than what has been seen from Western New York; the vine has proved to be a vigorous grower with healthy foliage, and, so far, satisfactory. Dutchess, fruit of best quality, vine very vigorous, but not entirely hardy; needs care. Jefferson, one of the best late reds, foliage healthy and vine tolerably vigorous. Prentiss has been fruited with much satisfaction; promises to be one of the best hardy whites. Notes and observations on many of the coming grapes were presented, which alone were of more value to thoughtful cultivators than the cost of membership in the society.

In *storing vegetables*, potatoes in a cool cellar, or buried in the ground, kept perfectly, the temperature at thirty-eight to forty degrees. Celery is more apt to be injured by heat than by cold; it has been well kept in moss. One speaker packs his close as possible, upright in a trench as deep as the height of the plants, covers with straw or hay and a roof of boards like the letter V inverted. *Grape grafts* should be kept dormant and be set below ground after the stock has got well started. In *strawberries* the Sharpless was accorded the chief place in the Northern part of the State, and as far south as Bridgeton one crop was sold at sixteen cents per quart, while other sorts brought only five cents. The second crop seemed to be best. The president's plot was heavily manured and well cared for, one feature being mulching in winter with a compost of muck and

slaughter-house manure. Primo is promising as to growth; Crystal City, small and few in number; Warren, variable; Mount Vernon, best with one, and a total failure with another, though treated to forty loads of stable manure per acre, and well treated in other respects. Experience with Glendale is very variable. Manchester bids fair to take a front rank as a market berry, having all the keeping and carrying qualities of the Wilson, and much superior in flavor, while the growth and vigor of plant are equal to Sharpless. Gypsy, exceptionally uniform in size and shape, one of the most productive of the well-known kinds. Bidwell seems to demand good treatment and hill culture. Jersey Queen, among the largest and most showy of all varieties; plants vigorous and healthy, but very high culture is required to secure best results. These conditions neglected, disappointment will surely follow.

Of *raspberries*, Hansell was commended for extreme earliness, good color and flavor, and excellent shipping qualities. Superb and Montclair, berries of large size, very good quality and productive; a week or so later than Hansell. These two bear a close resemblance to each other in size and appearance; the former sub-acid, the latter sweet. In making young plants the former multiplies more rapidly than the latter. Schaffer's Colossal, large, dark and productive; of great excellence for canning. Caroline, a fine flavored, salmon-colored berry of great value for the home garden. Cuthbert still maintains its position among the reds. Souhegan, a very promising blackcap. Hopkins, a Western variety, was stated to be of superior quality, as hardy and productive as any of the blackcaps, but rather soft for shipping.

Of *blackberries*, Early Cluster and Early Harvest are promising. Snyder, one said, is good to have when Wilsons are cut off by late frosts or other cause, as sometimes happens, but when Wilsons are plenty Snyder is not of much account. But for the orange rust, the Kittatinny would stand at the head of all known varieties for general use, but the prevalence of this fungus has destroyed whole plantations in some localities. On this account the New Rochelle and Taylor were named as varieties to supply its season.

An admirable paper on LILIES AND HOW TO CULTIVATE THEM was read, which ought to be in the hands of every one who would grow these beautiful flowers. Another one on INSECTS INJURIOUS TO HORTICULTURAL PRODUCTS, will be of great benefit to all fruit growers. Another on THE CLEMATIS, a complete treatise on these

valuable and justly popular ornamental climbers, was the most complete and exhaustive treatment of the subject that has yet been prepared for the public, and will be appreciated by every lover of these charming flowers. A paper on FUNGI AFFECTING OUR SMALL FRUITS, and one on PLANT FOOD AND PLANT DISEASES, were not read for want of time.

The show of fruits was exceptionally fine, and included several plates of the Kieffer pear, of large size and attractive appearance. The question-box contained queries as to its season, how to make it edible, etc. Its friends admitted that the quality varies, and they do not think last year's crop so good as usual. Some say this variety is about as variable as Duchess, or that they have eaten as poor specimens of that celebrated kind. It was also spoken of as valuable for canning, while its large size, early bearing and beauty combine to make it desirable. The critics wanted to get at the facts; if it is possible to make table pears out of such fine looking fruit, they want to know how to do it. Some growers, as well as sellers, may be indifferent as to whether the Kieffer will ripen to an edible state; others may not be able to find so ready a sale for it in that condition. The only answer to these points was that it is sometimes very good (see testimony of Messrs. Downing and Meehan), and why the samples before the meeting were so poor was evidently because they were unripe. Whatever the result of this inquiry, it is certain those who tested Kieffer for the first time here were sadly disappointed, and until their faith is strengthened they will willingly concede the monopoly of the market to their more enterprising friends. Some took the ground that quality is of little moment, so long as a fruit sells on its good looks; others think quality has much more influence in effecting sales than formerly, and that this influence is increasing. It was suggested that there might be a limit to the demand for cooking pears as well as to high prices.

A resolution of sympathy and condolence with Mr. Charles Downing in his recent affliction, and expressive of the hope that he may be spared to many more years of usefulness, was unanimously adopted.

Camden, Mt. Holly, Trenton, Somerville, and other places were proposed for next meeting and were referred to the Executive Committee for action.

The essays read and mentioned above will be printed in full in the annual report of the Society for 1882.

AGRICULTURAL

AND

HORTICULTURAL SOCIETIES.

LISTS OF OFFICERS,
STATISTICS AND CROP REPORTS.

OFFICERS OF THE

State Grange of New Jersey, Patrons of Husbandry,

FOR THE YEAR 1883.

<i>Master</i>	ISAAC W. NICHOLSON.....	Camden, Camden Co.
<i>Overseer</i>	JOHN STATESIE, Jr.....	Colt's Neck, Monmouth Co.
<i>Lecturer</i>	AUGUSTA COOPER BRISTOL.....	Vineland, Cumberland Co.
<i>Steward</i>	H. F. BODINE.....	Locktown, Hunterdon Co.
<i>Assistant Steward</i>	GEORGE H. GAUNT.....	Paulsboro, Gloucester Co.
<i>Chaplain</i>	RALPH EGE.....	Hopewell, Mercer Co.
<i>Treasurer</i>	CHALKLEY A. RULON.....	Swedesboro, Gloucester Co.
<i>Secretary</i>	JOHN W. DICKINSON.....	Woodstown, Salem Co.
<i>Gate Keeper</i>	E. E. HOLCOMBE.....	Lambertville, Hunterdon Co.
<i>Ceres</i>	MRS. ELIZABETH NICHOLSON...	Camden, Camden Co.
<i>Pomona</i>	MRS. ANNIE STATESIE.....	Colt's Neck, Monmouth Co.
<i>Flora</i>	MRS. EMILY BODINE.....	Locktown, Hunterdon Co.
<i>Lady Assistant Steward</i>	MRS. HANNAH C. HOLCOMBE...	Lambertville, Hunterdon Co.

EXECUTIVE COMMITTEE.

ISAAC W. NICHOLSON	Camden, Camden Co.
WILLIAM R. HANCOCK.....	Columbus, Burlington Co.
JOHN T. COX.....	Readington, Hunterdon Co.
ELLISON HORNER.....	Mullica Hill, Gloucester Co.
JAMES H. BAIRD.....	Marlboro, Monmouth Co.

POMONA, OR COUNTY GRANGES.

No. 1.—BURLINGTON.

Master.....H. F. BODINE.....Locktown.
Secretary.....F. S. HOLCOMBE.....Lambertville.

No. 4.—CUMBERLAND.

Master.....J. C. BOWEN.....Shiloh.
Secretary.....FRANK VAN VALIN.....Vineland.

No. 6.—SALEM.

Master.....RICHMAN COLES.....Woodstown.
Secretary.....REEVES FLITCRAFT.....Woodstown.

No. 7.—CAMDEN.

Master.....THEODORE HIDER.....Blackwood.
Secretary.....GEORGE T. HAINES.....Haddonfield.

No. 8.—GLOUCESTER.

Master.....THOMAS BORTON.....Mullica Hill.
Secretary.....ZILLAH H. ADAMS.....Mickleton.

No. 9.—MONMOUTH.

Master.....JAMES H. BAIRD.....Marlboro.
Secretary.....J. H. M. COOK.....Caldwell.

LIST OF DEPUTIES FOR 1883.

Burlington.....ROBERT TAYLOR.....Columbus, Burlington Co.
 Camden.....JOEL HORNER.....Camden, Camden Co.
 Cumberland and Cape May.....WINFIELD S. BONHAM.....Shiloh, Cumberland Co.
 Essex and Sussex.....R. F. HARRISON.....Roseland, Essex Co.
 Gloucester.....F. B. RIDGEWAY.....Mullica Hill, Gloucester Co.
 Hunterdon.....JOHN T. COX.....Readington, Hunterdon Co.
 Mercer.....THEODORE CUBBERLY.....Hamilton Square, Mercer Co.
 Monmouth.....JOHN STATESIR, Jr.....Colt's Neck, Monmouth Co.
 Salem.....RICHMAN COLES.....Woodstown, Salem Co.
 Morris.....WILLIAM F. ELY.....Hanover, Morris Co.
 Middlesex.....JAMES BISHOP.....New Brunswick, Middlesex Co.

LIST OF SUBORDINATE GRANGES.

NO.	NAME.	MASTER.	POST OFFICE ADDRESS.	SECRETARY.	POST OFFICE ADDRESS.
1	Pioneer.....				
2	Marl Ridge.....	B. A. Morton.....	New Egypt, Ocean county.....	F. S. Gaskill.....	New Egypt, Ocean county.....
5	Swedesboro	David S. Adams.....	Swedesboro, Gloucester county.....	Jennie L. Moore.....	Swedesboro, Gloucester county.....
6	Mount Laurel.....				
8	Moorestown.....	Charles Andrews.....	Fellowship, Burlington county.....	Sallie M. Ballinger.....	Moorestown, Burlington county.....
9	Woodstown.....	Reeves Flitcraft.....	Woodstown, Salem county.....	Emily Borton.....	Woodstown, Salem county.....
10	Paulsboro	William A. Mullen.....	Paulsboro, Gloucester county.....	George H. Gaunt.....	Paulsboro, Gloucester county.....
11	Vineland	Mrs. Mary Dowler.....	Vineland, Cumberland county.....	Miss Laura Ingalls.....	Vineland, Cumberland county.....
12	Ringoes	E. J. Strong.....	Ringoes, Hunterdon county.....	F. S. Holcombe	Lambertville, Hunterdon county.....
13	Cohansey	Isaac D. Woodruff.....	Bridgeton, Cumberland county.....	Norton S. Woodruff.....	Bridgeton, Cumberland county.....
14	Edgewood				
16	Hopewell	J. L. Mickel.....	Shiloh, Cumberland county.....	W. S. Bonham.....	Shiloh, Cumberland county.....
18	Cumberland	John Tylor.....	Greenwich, Cumberland county.....	Morris Goodwin.....	Greenwich, Cumberland county.....
24	Union				
26	Harrisonville.....	Charles H. Horner.....	Harrisonville, Gloucester county.....	Edgar C. Moore.....	Harrisonville, Gloucester county.....
29	Pittsgrove	George M. Graf.....	Elmer, Salem county.....	Emma F. Graf.....	Elmer, Salem county.....
30	Franklin				
32	Bridgeport	Lewis Warrington.....	Swedesboro, Gloucester county.....	David R. Black.....	Swedesboro, Gloucester county.....
36	Medford	David T. Haines.....	Medford, Burlington county.....	Edmund Braddock.....	Medford, Burlington county.....
37	Mt. Holly	Henry I. Budd.....	Mt. Holly, Burlington county.....	Lydia H. Gandy.....	Mt. Holly, Burlington county.....
38	Haddon	Amos Ebert.....	Kirkwood, Camden county.....	R. Levis Shivers.....	Camden, Camden county.....
39	Mantua	Joseph A. Leap.....	Hurfville, Gloucester county.....	Mary G. Duell.....	Wenonah, Gloucester county.....
40	Lawrence	Geo. W. Johnston.....	Trenton, Mercer county.....	Franklin Dye.....	Trenton, Mercer county.....
43	Hope	Joseph S. Glaspey.....	Bridgeton, Cumberland county.....	William B. Cook.....	Bridgeton, Cumberland county.....
49	Rancocas.....	Joseph Lundy.....	Rancocas, Burlington county.....	Uriah Borton.....	Rancocas, Burlington county.....
50	Pemberton	H. K. Price.....	Birmingham, Burlington county.....	H. R. Lippincott.....	Pemberton, Burlington county.....
51	Mullica Hill.....	Samuel Ashcraft.....	Mullica Hill, Gloucester county.....	Thomas Borton.....	Mullica Hill, Gloucester county.....
56	Readington.....	John T. Cox.....	Readington, Hunterdon county.....	Walter H. Opie.....	Readington, Hunterdon county.....
57	Centre Grove.....	John H. Earl.....	Millville, Cumberland county.....	William H. Taylor.....	Millville, Cumberland county.....
58	Columbus	Wardell DeCamp.....	Georgetown, Burlington county.....	Thomas A. Heller.....	Columbus, Burlington county.....
59					

LIST OF SUBORDINATE GRANGES—Continued.

NO.	NAME.	MASTER.	POST OFFICE ADDRESS.	SECRETARY.	POST OFFICE ADDRESS.
60	Course's Landing	N. R. Steward	Sharpstown, Salem county	Thomas Steward	Sharpstown, Salem county.
61	Crosswicks	A. Satterthwaite	Crosswicks, Burlington county	Elizabeth A. Rogers	Crosswicks, Burlington county.
61	Pennington	E. H. Drake	Pennington, Mercer county	S. B. Ketcham	Pennington, Mercer county.
66	Millville				
73	Ewing	John V. Green	Greensburg, Mercer county	George L. Howell	Trenton Junction, Mercer county.
74					
77	Mercer	Ralph Ege	Hopewell, Mercer county	W. S. Phillips	Hopewell, Mercer county.
79	Hamilton	William Clark	Hamilton Square, Mercer county	Azariah Cubberly	Hamilton Square, Mercer county.
81	Friesburg	J. M. Hitchner	Cohansey, Cumberland county	H. C. Perry	Alloway, Salem county.
85	Williamstown	Gotlieb Pfeiffer	Williamstown, Gloucester county	Joseph J. Ayars	Williamstown, Gloucester county.
87	South Vineland	D. M. Chandler	South Vineland, Cumberland county	S. A. Eaton	South Vineland, Cumberland county.
88	Locktown	William R. Bearder	Locktown, Hunterdon county	H. F. Bodine	Locktown, Hunterdon county.
90	Blackwood	J. R. Driver	Blackwood, Camden county	Ellie Stevenson	Blackwood, Camden county.
92	Monmouth	John Statesir, Jr.	Colt's Neck, Monmouth county	W. Craig Conover	Freehold, Monmouth county.
98	Allentown	R. C. Wain	Wainford, Monmouth county	F. T. Wetherill	New Sharon, Monmouth county.
99	Holmdel	D. A. Statesir	Marlboro, Monmouth county	S. B. Wells	Holmdel, Monmouth county.
101	Sergeantville	Joseph Hagerman	Lambertville, Hunterdon county	F. W. Venable	Sergeantville, Hunterdon county.
104	Livingston	J. H. M. Cook	Caldwell, Essex county	H. F. Harrison	Roseland, Essex county.
105	Morris	Henry W. Young	Afton, Morris county	Theodore A. Hopping	Afton, Morris county.
106	Kingwood	A. M. Van Dolan	Frenchtown, Hunterdon county	H. P. Shaw	Kingwood, Hunterdon county.

REPORT OF STATE GRANGE.

BY I. W. NICHOLSON, MASTER.

The Order of Patrons of Husbandry is in better condition in this State than for years past, and is increasing in numbers; the object of the Order being to develope a more intelligent management of the farm, not only by the members, but by all agriculturists.

This effort has, in some localities, been attended with all the success that could be expected in the time; with this result, a greater interest by both old and young in the farm and its improvement; more care in selecting stock and the cultivation of the crops, not for appearance alone, but for profit also.

Acquiring a better knowledge of the insect enemies to be contended with and the most successful way of combating them, which, heretofore, has, in many cases, made but slow progress, owing to the isolation of the farm.

The necessity for a more general and higher education has existed among farmers, which has prevented that love for agricultural pursuits which tends to the prosperity of the country, and should command greater respect for those engaged in it.

NEW JERSEY BREEDERS' CLUB.

ORGANIZED 1879.

*Officers for 1883.**President*—John I. Bishop, Columbus, N. J.*Secretary*—John P. Hutchinson, Georgetown, N. J.*Treasurer*—Chas. S. Taylor, Burlington, N. J.*Executive Committee*—Wm. S. Taylor, Burlington; Heulings Lip-pincott, Cinnaminson.

The members of the club are breeders of Jersey cattle. The meetings of the club are held monthly at the residences of members. Essays and criticisms occupy the time of meeting. Herds of members are examined, and the barns and buildings inspected and farms viewed.

The annual meeting is held in March.

Our membership numbers seventeen.

Respectfully,

JOHN P. HUTCHINSON, *Secretary*.

NEW JERSEY AND EASTERN BEE KEEPERS'
ASSOCIATION.

ORGANIZED 1882.

*Officers for year 1883.**President*—G. W. Thompson, Stelton, Middlesex county.*Vice President*—Ira Yeager, Hightstown, Mercer county.*Secretary*—Prof. J. Hasbrouck, Bound Brook, Somerset county.*Treasurer*—Prof. C. F. Kroeh, Hoboken, Hudson county.*Executive Committee*—T. F. Read, Brooklyn, New York; J. H. M. Cook, Caldwell, Essex county, New Jersey; C. H. Rue, Manalapan, Monmouth county, New Jersey.

REPORT FOR THE YEAR 1882.

This association was organized since the last meeting of the State Board of Agriculture. We quote from the preamble to the constitution.

Unity of action necessitates association coöperation, and coöperation presupposes individual effort. Impressed with these views, a few earnest individuals engaged in agriculture, or friendly thereto, met in New Brunswick, N. J., on the 15th of March, 1882, to consider the desirability of organizing a Bee Keepers' Association.

After the usual preliminaries, an organization was effected by the adoption of a constitution and by-laws, and the election of the initial officers of the association. It was resolved that the next meeting be held in New Brunswick.

The fall meeting was held in New Brunswick, on Wednesday, November 1st, 1882. The President, Mr. G. W. Thompson, called the meeting to order and delivered an extemporaneous address.

Delegates from the Philadelphia Bee Keepers' Society being present, were cordially welcomed and requested to take part in the deliberations of the meeting.

CLAMP WINTERING.

A paper by C. J. Robinson, of Richford, N. Y., elicited quite a discussion, strong grounds were taken on both sides, the prevailing

opinion being that in New Jersey bees may be successfully wintered on the summer stands; while chaff packing or a dead-air space, although a little more expensive, gave good results.

STATISTICS.

A paper by Prof. Cook, of Michigan Agriculture College, on a plan for gathering bee statistics, being next under discussion, the conclusion arrived at was, that no reliable statistics have hitherto been got together, nor was it likely to be, except the bee keepers themselves took it in hand, whereupon Mr. C. H. Rue, of Manalapan, N. J., was appointed a committee to coöperate with the National Bee Keepers' Association in collecting statistics as suggested by Prof. A. J. Cook.

SPECIALISTS.

A paper by the secretary, "Too Many Eggs in One Basket," the gist of which was, that except in rare and very favorable circumstances, bee keeping was not a success as a specialty, while it might be made a profitable adjunct to some other business.

This subject brought everybody on the floor, resulting in a lively discussion in which the veterans seemed to feel a little Jennie Geddis-like, while neophytes seemed hopeful. One thought well introduced and clearly defined was, that bee keeping, in its improved practice, was certainly a factor in civilization. To keep bees successfully, means thought, means investigation, means education, means devotion, means adoration, means looking through nature up to nature's God.

THE QUESTION BOX.

The question box contained several important subjects, such as "Can Virgin Queens be Successfully Introduced?" "Uniting of Nuclei;" "Winter Passages," whether through the comb or over the top of the frame. The latter seemed to have most favor. "How long will a Queen remain Profitably Prolific?" Very soon drifted with the Ulivi theory of queen fertilization, which brought clearly to the surface that to some it is an easy matter to throw off the chains of previous servitude, while others hug them with a tenacity almost human, giving force and power to the lecture "On Thinking," delivered at Farmers' Institute, in connection with one of our Western Agricultural Colleges.

ATLANTIC COUNTY.

ATLANTIC COUNTY BOARD OF AGRICULTURE.

*Officers for 1883.**President*—Thos. Rodgers, Hammonton.*Secretary and Treasurer*—Z. U. Matthews, Hammonton.*Board of Directors*—M. C. Swift, E. Adams, A. S. Gay, A. Somerby, C. C. Stuart, I. P. Patton, S. H. Tyler.*Delegate to State Board*—Z. U. Matthews, Hammonton, Atlantic county.

Annual fair at Hammonton in September.

EGG HARBOR CITY AGRICULTURAL SOCIETY.

ORGANIZED MARCH 23d, 1859.

*Officers for 1883.**President*—Philip Bergmann, Egg Harbor City.*Vice President*—Bernard Grawe, Egg Harbor City.*Secretary*—Valentine P. Hofmann, Egg Harbor City.*Treasurer*—William Behns, Egg Harbor City.*Librarian*—Louis Young, Egg Harbor City.*Board of Trustees*—John Prach, Sr., Frederick Fiedler, Louis Schmalholz.

The society has at present fifty-five members.

The annual fair will be held at Egg Harbor the second or third week in September.

ATLANTIC COUNTY CROP REPORT.

By Z. U. Matthews, Hammonton, New Jersey.

Much of the county is very sparsely settled. Vast tracts of land have never been taken up for cultivation. Much of it has been supposed to be almost worthless for agricultural or horticultural purposes.

Yet we believe that the day is not far distant when these vast tracts of unoccupied land, and which to many seem like a barren waste or desert, will be yielding good crops of fruit and vegetables, and, to some extent, grain and grass. Along the whole line of the shore, and in some places for miles back are fine farms, yielding large crops of all kinds of farm products. Atlantic City makes a good market for all the fruit and early vegetables this section can produce. The settlements which have grown up in the interior and northwestern portions of the county have given more particular attention to growing fruits, although they produce, to some extent, corn, rye, grass and all kinds of vegetables—Egg Harbor City taking the lead in grapes, and Hammonton in berries, especially blackberries.

The weather the past season has, in the main, been favorable for crops. The only drought we experienced was from the middle to the end of July, during which time we had several very hot days, which did a good deal of damage to some corn and blackberry fields. Since August the supply of rain has been abundant, which we believe will be of great advantage to our crops the coming season.

About two weeks ago postal cards with prepared blanks were sent to prominent farmers in different parts of the county, to be filled out and returned to the secretary. From these we report the condition of crops the past season. On some crops these reports differed materially; in such cases we have struck an average: grass crop, medium to good; corn crop, good; early potatoes, medium to good; late potatoes, medium; sweet potatoes, good; turnips, poor to medium; carrots, medium; beets, good; cabbage, poor to medium; asparagus, good; wheat, medium to good; oats, medium; rye, good; grapes, good; apples, poor; peas, poor; strawberries, medium to good; raspberries, medium; blackberries, medium to good.

In Hammonton, where berries are grown quite extensively, the blackcap crop was almost a total failure; the red raspberry not more than one-half a crop; and there were many more imperfect blackberries than we ever knew the Wilson to produce before, and during the extreme heat in July they dried up much worse than usual. And we believe the cause of all this was the severe drouth of the previous fall, which must have weakened the canes very much.

We expected to receive a full report of the grape crop in Egg Harbor, but were disappointed; presume you may have a report direct to the State Board. The rose bug was terribly destructive to

many of the vineyards in Hammonton the past season. One of our members, who has nine acres in grapes, had nearly his entire crop destroyed by them. So far we have been unable to find anything that will destroy them without picking them off, and to do this would require nearly as many men as you have vines, they come in such vast swarms.

In conclusion, we will say that we believe the farmers of Atlantic county have cause for gratitude for the general prosperity they have enjoyed during the past year.

BERGEN COUNTY.

BERGEN COUNTY AGRICULTURAL SOCIETY.

Officers for 1883.

President—J. H. Bamper, Hohokus.

Vice President—J. A. Osborne, Hohokus.

Treasurer—J. A. Bogert, Hohokus.

Recording Secretary—M. D. White, Hohokus.

Corresponding Secretary—J. A. Van Emburg, Hohokus.

Annual fair—Hohokus, September 25th, 26th, 27th.

BURLINGTON COUNTY.

BURLINGTON COUNTY BOARD OF AGRICULTURE.

ARTICLES OF ASSOCIATION.

The subscribers, representing the following organizations, do hereby certify they have this 30th day of December, A. D. 1882, organized the Burlington County Board of Agriculture, under the provisions of a statute of New Jersey, entitled "An act to organize and establish a State Board of Agriculture," approved April 4th, A. D. 1872, and amended by supplement thereto by an act, approved March 18th, A. D. 1882, providing for the organization of County Boards of Agriculture, and have this day elected the following named officers and directors to serve for the term of one year or until their successors are elected.

OFFICERS AND DIRECTORS.

President—John E. Darnell.

Vice President—Emmor Roberts.

Secretary—Henry I. Budd.

Treasurer—William R. Hancock.

Directors—Isaac Fenimore, Burlington County Agricultural Society; Clayton Conrow, Moorestown Agricultural Society; Mark H. Buzby, Mount Laurel Farmers' Club; Edmund Braddock, Medford Grange; James Lippincott, Mount Holly Grange; Edmund Cook, Columbus Grange; Joshua Forsyth, Pemberton Grange; Alfred Satterthwaite, Crosswicks Grange; Joseph Lundy, Rancocas Grange; Samuel C. DeCou, Moorestown Grange; Ambrose M. Risdon, Mount Laurel Grange.

Delegate to State Board—Wm. R. Hancock, Columbus.

CHARTER MEMBERS.

Societies.	Members.	Delegates.
Burlington County Agricultural Society.....	400	80
Moorestown Agricultural Society.....	250	50
Mount Laurel Farmers' Club.....	110	22
Medford Grange.....	55	11
Mount Holly Grange.....	20	4

Societies.	Members.	Delegates.
Columbus Grange.....	80	16
Pemberton Grange.....	35	7
Crosswicks Grange.....	30	6
Rancocas Grange	20	4
Moorestown Grange	95	19
Mount Laurel Grange.....	26	5
	<hr/> 1121	<hr/> 224

CONSTITUTION AND BY-LAWS.

1. This organization shall be called "The Burlington County Board of Agriculture."

2. The object of this board shall be to act in connection with the State Board of Agriculture for the collection and dissemination of agricultural information, the furtherance of agricultural experiments and for the general promotion of agriculture and horticultural industries in Burlington county.

3. Any agricultural or horticultural society, farmers' club, or grange in the county may become a member of this board by signing its articles of association, and shall be entitled to one representative for every five *bona fide* members thereof.

4. The officers of this board shall be a president, vice president, secretary and treasurer, who shall, with eleven others, constitute a board of directors, all of whom shall hold office for the term of one year, or until their successors are elected, and who shall be elected at the annual meeting by a majority of those present. The duties of the directors shall be to collect and report the result of experiments for the benefit of agriculture.

5. The president shall preside at all meetings. In case of his absence the vice president, and in the absence of both, any member selected by the meeting may preside.

6. The secretary shall keep the minutes of the board, call the meetings at the request of three members, collect the dues and pay them to the treasurer, receiving proper vouchers for the same. He shall receive such compensation as the directors shall think just.

7. The treasurer shall pay all bills of the board, after being attested by the president and secretary and ordered by the board, and his books shall be, at all times, open to inspection by any member of the board.

8. The annual fees of each organization composing this board shall be five cents for each member of each organization composing the

board, to meet the current expenses—to be collected and paid within sixty days by each organization to the secretary of this board.

9. The regular meetings of the board shall be at Mount Holly, on the last Saturday of July and November, at ten o'clock A. M., and a majority of those present shall constitute a quorum for the transaction of any business.

10. The board at the annual meeting—on the last Saturday in November—shall appoint a delegate to the State Board of Agriculture, who will hold his position as member of said Board for one or two years, as said State Board may determine.

11. The constitution and by-laws may be altered or amended at any regular meeting, provided written notice of the same be given at any previous regular meeting.

12. The order of business shall be: 1. Calling roll of members; 2. Reading minutes of last meeting; 3. Reports of standing committees; 4. Reports of special committees; 5. Bills and accounts; 6. Unfinished business; 7. New business; 8. Suggestions for the benefit of the organization; 9. Adjournment.

MOUNT HOLLY, February 6th, 1882.

To P. T. Quinn, Esq., Secretary of State Board of Agriculture:

Pursuant to a call made through the newspapers of the county by William S. Taylor, Chairman of the Executive Committee of the State Board of Agriculture, to meet at the court house, Mount Holly, on December 30th, A. D. 1882, at two P. M., to organize a county board of agriculture, the above named agricultural societies, farmers' clubs and granges responded, and were represented by 224 delegates.

William S. Taylor called the meeting to order and stated its object. John E. Darnell was made temporary chairman, and William S. Taylor, temporary secretary.

Henry I. Budd, David T. Haines and Ambrose M. Risdon were appointed a committee on credentials.

Henry I. Budd, Robert Taylor, Edmund Cook, William Parry and Judson C. Gaskill were appointed a committee on constitution and by-laws.

The above is the result of the action of the committees and meeting.

Respectfully,

HENRY I. BUDD, *Secretary.*

*Officers for 1883.**President*—Isaac Fenimore, Lumberton.*Vice-President*—Wm. S. Taylor, Burlington.*Recording Secretary*—John B. Collins, Mount Holly.*Corresponding Secretary*—Henry I. Budd, Mount Holly.*Treasurer*—Edward B. Jones, Mount Holly.*Board of Directors*—Isaac Fenimore, Wm. S. Taylor, Henry I. Budd, Benj. F. Deacon, Wm. R. Hancock, Henry Ellis, Samuel H. Chambers, John B. Collins, Wm. R. Lippincott, Wm. C. Parry, Joseph Wills.*Finance Committee*—Jas. Lippincott, Theo. H. Risdon, Jas. W. Deacon.

Annual fair, October 9th, 10th, 11th and 12th, Mount Holly.

TREASURER'S REPORT.

RECEIPTS.

From advertising in schedule of 1881.....	\$364 00
Stand rent, 1881.....	30 00
Rent of pasture.....	183 00
Rent of dinner and refreshment stands.....	1,853 50
Rent of amusements.....	725 80
Admissions to grand stand.....	648 75
Admissions to grounds.....	9,224 05
Crossing the track.....	96 00
Hat, coat and package room.....	28 00
Entrance money on horses.....	2,231 50
Advertising in schedule of 1882.....	375 00
Old lumber sold.....	36 55
Sundries.....	8 00
Notes.....	8,972 00
	<hr/>
	\$24,776 15

EXPENDITURES.

Balance due treasurer at last report.....	\$951 84
Commissions on advertisements in schedule of 1881.....	91 00
Dues National Trotting Association.....	56 00
Printing schedule.....	325 00
Advertising.....	551 01
Printing.....	589 55
Music.....	175 70
Dining tent.....	254 45

Hay, straw and feed.....	\$599 91
Insurance.....	21 50
Postage.....	169 38
Material and work on new buildings, and moving stables.....	2,396 55
Medals	90 55
Decorating building.....	55 00
Repairs.....	132 83
Telegraphing.....	15 97
Entrance money refunded.....	13 00
Fair supplies.....	65 39
Land purchased of R. Hankinson.....	2,660 00
Detectives, laborers, clerks, &c.....	1,392 10
Salaries.....	650 00
Work on new track.....	485 00
Commissions on advertisements in schedule of 1882.....	93 75
Sundries.....	91 35
Base ball premiums.....	403 75
Other premiums.....	7,818 75
Notes paid.....	4,000 00
Balance in treasurer's hands.....	626 82
	<hr/>
	\$24,776 15

LIABILITIES.

Outstanding notes.....	\$6,500 00
------------------------	------------

ASSETS.

Balance due on account of stand rents.....	\$589 00
Cash in treasurer's hands.....	626 82

DIRECTORS' REPORT.

The Directors' report was then read by Isaac Fenimore, the President of the Society, as follows :

Mr. Chairman and Stockholders of the Burlington County Agricultural Society :

The ever-recurring seasons have again brought around the period when it is our pleasure and duty to report our doings for the past year, and our recommendations for the future.

Our annual fairs for a number of years have been blessed with the clearest of days, and the finest of weather, the elements always seeming to rest their fury until the show was over ; but this year they reversed their usual habit, and made, for the whole fair season, rain the rule and good weather the exception, causing loss to most organi-

zations of this kind. The rainy and continuous threatening weather caused thousands of our intending visitors to remain at home, and forced us to continue our fair one day longer than the appointed time, in order to carry out our track programme, the track during Thursday being too wet and soft for use.

Yet with this severe drawback, our liberal advertising, great reputation, fine display and multitudinous attractions persuaded so many to brave the elements, that our attendance was within 1,167 persons of that of 1881, and 1,500 over that of 1880; being for 1880, 25,357; for 1881, 28,033; for 1882, 26,866, reducing our cash from admissions \$334.70. Admissions 1881 realized \$9,558.75; admissions 1882 realized \$9,224.05. Our receipts from all sources, except money borrowed, were in 1881, \$15,600.40; in 1882, \$15,554.15, being \$45.25 less than last year. The expenses, less notes paid, were \$20,045.18.

The grand stands fell short \$482.10 on account of receiving nothing from them on Thursday (the large day). We are also short of last year \$267 on our refreshment stands. Although they sold for more, the dull weather and other causes prevented them from earning enough to pay the purchase price. The returns from the special privileges, side shows, horse entrance and pasture are in excess of last year. The expenses and premiums have very sensibly increased, the first partly owing to the extra day and advertising the same.

We herewith submit a comparative statement of the main receipts and expenditures for 1881 and 1882.

	RECEIPTS.	1881.	1882.
Entrance from horses.....		\$1,721 50	\$2,231 50
Rent of pasture.....		126 00	183 00
Advertising in schedule.....		354 00	380 00
Dinner and refreshment stands.....		2,150 50	1,853 50
Old wood, lumber, straw, &c.....		65 25	36 55
Crossing track.....		178 00	96 00
Special privileges and side shows, &c.....		688 15	725 80
Admissions to ground.....		9,558 75	9,224 05
Admissions to grand stand.....		1,130 85	648 75
	EXPENDITURES.		
Advertising and printing.....		889 10	1,138 56
Printing schedule.....		321 75	330 00
Hay, straw and feed.....		390 09	599 91
Postage		142 63	169 38
Improvements and purchase of land.....		1,468 07	5,704 68

	1881.	1882.
Guest and dining tent.....	\$255 03	\$254 45
Police, clerks, guards and labor.....	1,204 92	1,393 10
Interest.....	273 60	330 00
Soliciting advertising in schedule.....	88 00	95 00
Salaries	650 00	650 00
Premiums, base ball, &c.....	7,297 00	8,322 50
Music	130 70	175 70

The pressure from many of our stockholders and exhibitors to provide more room and a better shaped track, induced us, after much hesitation and deliberation, to enter into negotiations with Risdon Hankinson for 5.32 acres of land on the north side of our grounds, which we succeeded in purchasing at the extreme price of \$500 per acre, entailing upon the society a cost of \$2,684.10 for purchase, search, survey, deed and record of the same. The cost of moving the fences, seventy-five stables and building forty new ones, to fit the boundaries of the new purchase, was about \$2,257.77.

The addition has given room for laying out a perfect regulation track, sixty feet wide on the home stretch and fifty feet wide on the remaining portion of the circle; avoiding the objectionable corners of the old course. This track has been surveyed, and the grading contracted to Benjamin M. Richardson for the sum of \$1,200; he has already spent on same over \$400, and expects (frost permitting) to finish the same by early spring. When done it will be one of the most perfect, for shape and footing, known to the trotting community.

The location of the new track necessitates the removal of the grand stands some distance northwest of their present location. This, with remodeling the same to insure a perfect view of the track exercises without standing, will entail an additional expense of at least \$1,000. These additions and changes will give much needed room between the entrance and exhibition buildings and the grand stands, for the erection of new and permanent refreshment booths, if desired, and the display of farm machinery; and thus relieve the latter from the danger resulting from its former location in the inside ring, and enable persons to visit it without running the risks of crossing the track.

The exhibits for special premiums offered by merchants and others, have in two years grown to such numbers that they will have to be assigned to a separate place or department to properly show them. Those offers this year brought out several hundred loaves of bread, cakes and pounds of butter, besides many fancy articles. The

animals and articles exhibited amount to about 4,000 in number. The Jerseys were displayed in large number and great beauty, but there was a deficiency of other cattle, as well as of sheep and swine; some measure should be devised to persuade a large exhibit of these animals.

The building displays of fruit, vegetables and ladies' work were uncommonly large and fine.

The poultry and pigeon exhibit was unusually fine, and is said by fanciers to excel the most of exclusively poultry shows. Our fairs are assuming such proportions that exhibitors think it of little use to incur expense to bring inferior articles and animals; consequently, we have each year a greater proportion of the choicest in all departments.

The new land and improvements will entail an outlay of about \$8,000, and is large on account of the excessive price paid for the land, and the cost of moving so many buildings, and the great amount of dirt to properly grade the track, and required some deliberation on our part before making the venture. But when we come to take into consideration the standing of our society at the present time, and that it had almost wholly been attained through liberality in its management, through a disposition to furnish requisite improvements and accommodation, we concluded that it would not do to make a halt in the progress of an organization that promised so much for the future. We believe the improvements now being consummated will not only draw out a larger exhibit in many departments, but a large attendance to view them, and thus pay a handsome interest on, and gradually dissipate the debt consequent upon, the investment.

In our last annual report we dwelt briefly upon the utility of conducting our fairs for the benefit of production, and if you will compare each of those that have been recently held with the one immediately following it, you will find a constant improvement, not only in the quantity, but notably in the quality of the exhibits. Most of you remember a few years ago, after we had erected our main building and our accommodations were tolerably ample, that our worthy friends, Henry Campbell and Denise Brothers, of Monmouth county, were induced to bring and add to ours an exhibit which they were annually in the habit of preparing for the Freehold fair; and we venture to say, that you observed that said exhibit was very superior. So much was this the case that, when compared with our own county's showing in the same line of exhibits, the contrast was anything but

favorable to the home county. Since that time this friendly rivalry has been kept up, participated in more recently by Joseph M. Kaighn & Son, of Camden, and Jacob H. Leeds and others, of our own county, with superior exhibits, which competition has resulted in a much improved showing on the part of Burlington county. It was a matter of much interest to some of us at our late fair to witness the great concern that these rivals manifested in their particular line of productions, one having gained a point in this, and the other in that respect. It was with no little satisfaction that our worthy friend, Jacob H. Leeds, made his showing of a field averaging forty-seven bushels of very superior wheat per acre, exceeding the yield of this cereal given by our friends of Monmouth by two bushels per acre. It was quite observable, however, that our worthy neighbors did not scare; they seemed to be getting all the points of culture from Mr. Leeds that they could, and we are told that they purchased of him some of Allen's fertilizer, one of the principal agents in the production of his superior yield, to use on the coming crops, and you need not be surprised to find them on the top round next time, even exceeding forty-seven bushels per acre.

Not till we properly appreciate this progressive spirit, this productive enterprise that is ever on the alert to utilize the resources and wastes of nature, and bid them minister to the wants of man and the nation's wealth, are we prepared to adequately estimate the necessity of using every means at our command, to spread broadcast over the land every new idea, every new discovery in the way of implements, seeds or kinds of stock that may enter into the make-up of our prosperity and happiness as a people.

While we do not contend that the production by a people of material upon which to subsist, is the one essential to civilization, we do take the ground, that in importance it towers above any and all others, from the fact that no other can exist without it. Lay aside the plow and the hoe, and allow the earth from time to time, with all its natural and acquired productiveness, to produce all that refreshing air, genial sun and copious rain could induce, and the supply of material upon which to live would diminish to mere nothingness. Not only would the busy tread of civilized industry be stilled, but hunger and want as a besom of destruction would sweep the greater portion of the inhabitants from the face of the earth; our boasted cities and towns, with their great marts of trade, would moulder and decay and become

one vast ruin ; those noted institutions of charity and learning, and those vast edifices erected and dedicated to God, would cease to do their holy work. Our fair earth, covered over with cultivated fields and dotted and interlined in every direction with the marks of civilization, would become a vast wilderness inhabited by uncivilized tribes, whose only essence of government would be their power to overcome each other, unmingled with any of those principles that characterize civilized governments.

Dispense with the tilling of the soil, and not only would the world be deprived of the great beneficence resulting from the thought and industry of man, in the prosecution of the great works of commerce, manufacture, the arts, science, education and religion, but the gifts of nature that are bestowed in those vast areas of timber that abound on every side ; those inexhaustible beds of metals, coal and other minerals would fail of their purpose for the want of a civilization to bring them into requisition ; in vain would the clouds gather to shed forth the refreshing rain to nourish and sustain vegetation. In vain, in a great measure, would have been the creation of man, for God, in his high and holy purpose, did not intend that man should roam about the earth in an uncivilized condition, subsisting upon the spontaneous productions of the earth, preying upon and waging continual war with his fellow, but created the earth as a habitation in which for him to live, abounding in plenty on every side, and gave to him the following command : "In the sweat of thy face shalt thou eat bread, till thou return unto the ground."

The design then seems to have been to place man within reach of an abundance of all things necessary to his comfort and happiness, and only allow him to possess and enjoy them through the exercise of his physical, mental and moral forces.

As we gaze upon the mirrors thus presented before us, we behold no reflection that personates idleness in its fell deformity ; but industry in its peaceful robe of white, bearing upon its visage the marks of toil and care, appears upon the scene, equipped and ready for the conflict designed for man on this earthly sphere.

We relate these facts and make these allusions to bring more clearly to the mind of the agriculturist the very important and responsible position he occupies ; his vocation seems to stand in about the same relation to other industries in the production of civilization as the main-spring of a watch does to the rest of its manifold workings in

the measuring of time ; which, when the tension of the main-spring is impaired, the movements are imperfect and the time unsatisfactory ; and when the main-spring ceases to work, the other parts become idle and no time is measured.

If these premises be correct, how important is it that those of any and all occupations should do all in their power to advance the great cause of agriculture. Well may the mechanic draw upon his inventive genius in the construction of useful machinery ; well may the man of science brood over the intricacies of his profession in quest of new modes and discoveries ; well may all without distinction of trade, profession or occupation, prosecute their each and every calling, with all the vigor and intelligence they can command, and when their efforts are rewarded with meritorious results, let the same be communicated through some public channel to their fellow-men. Let the facts and details in connection therewith be clearly and concisely stated and published in some agricultural or other industrial record, that the acquisition may be spread broadcast over the land, and thereby give such an impetus to production that will strengthen the arm of each and every industry, and enable us as a great human family to proceed more energetically and intelligently in the solution of the great problem of our existence : the sustaining, educating, civilizing and Christianizing mankind.

CROP REPORT.

By Henry I. Budd.

MOUNT HOLLY, February 6th, 1883.

P. T. Quinn, Esq., Secretary State Board of Agriculture:

DEAR SIR—I herewith present a description of the general yield, condition and prospects of crops in Burlington county during the past and present years.

The yield of wheat was unusually fine, ranging on improved lands from twenty to thirty bushels, and in some cases over forty, averaging at least twenty-five bushels per acre, and is perhaps the largest in total ever known to this county, which fact is largely owing to the general cultivation of the Fultz variety, which I think has added at least ten bushels to the average production of each acre over the older varieties.

The growing wheat and rye, where seeded early, has a heavy top

and promises finely, but late seeding looks bad, owing to the absence of a warm winter to promote root growth.

The progress of corn was almost checked by the very dry weather of July, but the abundant rains of August revived and promoted a rapid growth; then the winds and drenching rains of September prostrated and broke it as seldom seen in our county. The result was an unexpectedly good yield of corn, of which a larger proportion was more mouldy, damp, shrunk and unfit for storing, than has been known for years. The yield is reported all the way from thirty to seventy-five bushels, but the average will not exceed forty bushels per acre.

Rye was a good crop, yielding from fifteen to twenty bushels and one ton of straw per acre.

White potatoes were a fair crop; they suffered much from the hot, dry weather of July, and the abundant moisture of August and September.

Sweet potatoes made an unpromising start, but eventually yielded the best crop known for years. The low prices steadily prevailing for them, indicates a general heavy production.

Grass and hay were not average crops, owing to the dry weather of this and previous seasons, destroying the roots and shortening the growth, but it was secured in such good condition that it is of more than average value. It was supplemented by a very late and abundant pasturage.

The crops of small fruits were fair. Strawberries on dry soils, poor; on moist locations, very good; nice berries sold well. Raspberry crop fair; sold well. Blackberry yield fair to good, but sold lower than for several years. Cranberries small in quantity, but command high prices.

The apple crop was a very light one, small in size, and of very poor quality; fell early from the trees, and when stored quickly rotted; cannot remember a time when farmers had so few winter apples; at this writing our native varieties are absent from the cellar and market.

Our peach orchards were set very heavily with young peaches; this, with the extreme drought of July, produced fruit of very poor quality.

Pears were almost a failure. Bartlett's, heretofore considered infallible bearers, presented many trees entirely barren of fruit. For all of the larger kinds there are so many insect enemies that in the struggle for existence the insects become the better man, by dropping the fruit

from the trees before maturity, dwarfing and rendering imperfect those that remain.

If the talent of Boards of Agriculture, Experimental Stations and similar organizations could be directed to the discovery of means to destroy these enemies or prevent their depredations, they would earn the everlasting gratitude of producers, by saving to them each year millions of dollars.

Only a few years since our orchards of apples and peaches bent and broke with their burdens, and covered the ground with delicious fruit, furnishing not only the family and market with abundance, but thousands of bushels for the swine and cattle and for distillation. But now to the average farmer they are almost as much of a luxury as tropical productions.

The demand for milk in our large towns and cities is becoming so great, and the prices so remunerative, that the creameries of our county have only been able to obtain a meagre supply, consequently the Mount Holly and Crosswicks creameries have suspended operations and sold their fixtures, while the only one remaining is at Hartford and is leading a precarious existence. Having a costly building and fixtures, it is struggling hard to utilize them, hoping for a period when the price of milk will approximate the results obtained from working it into butter and cheese. The experience thus far obtained with creameries indicates they cannot be made profitable where milk can quickly and cheaply be sent to large cities. Their mission thus far has only been to enable the shippers of milk to realize large prices by relieving their market of the surplus.

While the number of silos in our county has not largely increased over last year, they all report satisfactory results, both in saving large quantities of hay for the market (heretofore fed out each winter), and producing a larger quantity and better quality of milk. James Lipincott, Jr., the pioneer of ensilage in our county, reports he has used it for three years, considers it a great saving of fodder, is now feeding one-half ensilage and one-half ground corn stalks, with three quarts of bran and corn meal at each feeding, twice per day. Is feeding no hay. By the use of this feed farmers can sell the most of their hay. His cows milk well and produce a first quality of milk, and he considers ensilage the cheapest, best and most profitable feed that a dairyman can use. With improved and more economical methods of gathering and storing, the chances are that silos will come into general use.

The cutting and mashing of dried corn fodder, which, during the past two years has, in our county, been largely practiced, has effected a saving of full half of the fodder over the old-fashioned plan of giving the stalks in full length for the cattle to pick off the leaves.

The large prices obtained for beef, calves, swine and poultry has induced many of our farmers to enter more largely into their production, consequently their financial condition is much better than for many previous years, and this is particularly evidenced by the great falling off in demand for bank accommodations. Yet the prices of farming lands have not much appreciated—are selling as low as before the war, and, in many cases, when offered, are not meeting with sale, which fact is owing to the great difficulty in obtaining sufficient and skilled labor to smoothly manage and perform the work of the farm. There is too much manual labor in the occupation for the taste of the average Burlington county farmer.

Following is a record of the rain-fall in our county for 1882, kept by Thos. J. Beans, living near Moorestown, who is a careful observer, and has, for twenty years, given the Agricultural Department at Washington condition of crops and weather in our county, and to whom I am indebted for many facts in this paper: Rain-fall for 1882—January, 5.82 inches; February, 4.29 inches; March, 2.65 inches; April, 2.33 inches; May, 5.03 inches; June, 2.17 inches; July, 1.40 inches; August, 9.44 inches; September, 11.71 inches; October, 1.60 inches; November, 1.27 inches; December, 1.84 inches.

The different degrees of moisture indicated in the *growing* months is a good index of the progress and condition of the various crops. The abundant rain-fall of May gave all a rapid send-off.

The dryer weather of June perfected the wheat, was right for corn in its small stage, checked the growth of grass but enabled it to be gathered in excellent condition. The drought of July allowed the harvesting of the wheat, rye and remaining grass in perfect condition, but checked the growth of corn, it then being in a stage when considerable moisture was needed. The excessive rains of August revived its declining vitality, the still larger rain-fall of September perfected a luxuriant growth, but presented a badly damaged ear crop. Wheat sown in early September had enough moisture to secure a large root and top growth, while that sown later did not obtain sufficient water to carry it safely into and through the winter.

Thos. J. Beans writes me "that the citron or cantaloupe crop is an

important one in our part of the county. They are of the finest quality in hot, dry weather, with just enough moisture to promote the growth, and are not nearly so good during rainy periods. Early, they were very good, but under the heavy rains of the later season they rapidly deteriorated, until, though of fine appearance, they would not sell in the market. In 1881, raised from three and one-quarter acres 1,400 baskets, which sold for \$504.65, while in 1882, two and three-quarters acres only brought me \$155."

The latest deadly frost in spring was on May 3d, the earliest deadly frost in autumn was on November 3d. The very light frosts of October 26th and 27th did no harm, thus giving us a late growing season. The average rain-fall during the past nineteen years in our county being for August 4.52 inches, for September 3.72, there is no difficulty in explaining the effects produced by 9.44 inches last August or 11.71 inches last September.

Below is a statement of results in crop raising in different portions of our county during the past year: The farm committee of Moorestown Grange report 5,108 acres in their jurisdiction; 4,793 of which are under cultivation; of this 678 acres in Indian corn, averaged per acre, forty-five bushels; 557 acres in wheat, averaged twenty-eight bushels per acre; 1,230 acres in hay, averaged one and one-half tons per acre; 245 acres of potatoes, moderate yield. Balance of acres in pasture and small fruits, cabbage, tomatoes, sugar corn and other truck, which are extensively cultivated in that community. Dairying is divided between selling milk to creamery and Philadelphia, making butter and fattening calves, results from each branch above the average on account of the price of the products of the dairy being higher.

B. Bishop, thresher around Moorestown, reports, through Thomas J. Beans, the following wheat crops:

	Acres.	Per acre.	Bushels.
A. Lippincott.....	16	32 $\frac{3}{4}$	524
E. Dudley.....	16	27 $\frac{1}{2}$	439
W. B. Lippincott.....	16	27	429
William Parry.....	12	24 $\frac{3}{4}$	296
W. F. Morgan.....	9	31	277
Joseph Morgan.....	25	33	792

James Carson's whole tillage averaged thirty-eight and one-half bushels per acre.

Samuel Haines, miller, Rancocas, reports some wheat crops received by him :

J. H. Leeds.....	47 bushels Fultz wheat per acre.
Mark Haines.....	40 bushels Mediterranean wheat per acre.
M. S. Haines.....	35 bushels Fultz wheat per acre.
William Austin.....	33 bushels Fultz wheat per acre.
H. H. Wills.....	33 bushels Fultz wheat per acre.
J. W. Clothier	30 bushels Fultz wheat per acre.
W. S. Taylor.....	32 bushels Mediterranean wheat per acre.

George E. Gaskill has threshed the following crops of wheat :

James Logan.....	719 bushels,	25 per acre.
Edmund Cook.....	430 bushels,	40 per acre.
David Ewan.....	1,075 bushels,	20 per acre.
Charles S. Taylor.....	1,360 bushels,	30 per acre.
Aaron Harker.....	985 bushels,	25 per acre.
William Evans.....	491 bushels,	38 per acre.
Harry Harker	537 bushels,	35 per acre.

With most of these larger crops of wheat there was from from 200 to 400 pounds of patent fertilizer used per acre ; these are coming into more general use in our county, and are largely increasing the yield of wheat.

Jacob H. Leeds, Rancocas, reports 15 acres of wheat yielded 436 bushels ; 5 of which yielded 47 bushels per acre, 235 bushels ; 4½ acres of potatoes, 200 bushels per acre, 900 bushels ; 30 acres grass, 2½ tons per acre, 75 tons.

David T. Haines, Medford, 6 acres Indian corn, 75 bushels per acre, 450 bushels.

John Croshaw, Mount Holly, 3 acres of boiling corn, 50 bushels per acre ; profit of crop, \$80 per acre, \$240.

Edmund Braddock, Medford, one acre of cabbage, 4,500 cut heads, 5 cents, \$225 ; 3 acres of cabbage returned \$550.

Samuel R. Lippincott, Hartford, one acre tomatoes yielded 547 baskets, sold at 31 cents per basket, realizing \$169.57 ; one acre of cabbage, 4,890 heads at 5 cents, realized \$244.50.

Ridgway Hancock, near Burlington, 4½ acres tomatoes yielded 2,300 baskets, or 515 baskets per acre, sold to canners for 23 cents, \$117.53 per acre, total \$529.

W. R. Porter, Edgewater, one-half acre carrots, 150 bushels, at 60 cents, \$90.

Joseph E. O. Ballinger, Medford, one acre cranberries yielded $183\frac{1}{2}$ bushels, which, at \$4 per bushel, amounted to \$734.

William B. Lippincott, Hartford, 2 acres small tomatoes, \$225.40.

James Lippincott, Jr., on the Jacksonville road, bought last spring 200 of the Big Bob strawberry plants from A. M. Purdy, for which he paid \$10 per 100. He set them out on 3,000 square feet of land, and has thus far sold 39,500 plants at \$30 per 1,000, and expects to sell altogether 50,000 plants at the same figure, making in all \$1,500.

Elijah W. Haines, living on a farm of 200 acres, between Mount Holly and Vincentown, has raised 30 acres of wheat, $26\frac{2}{3}$ bushels per acre, 800 bushels; one acre of Burbank potatoes, 300 bushels; 38 acres of corn, 50 bushels, about 2,000 bushels; 69 hogs and pigs fattened, sold for \$2,000. Keeps 30 cows, from which he has this year sold milk to the amount of \$2,000.

Isaac C. Haines, two miles northwest of Mount Holly, raised 12 acres of Fultz wheat, which yielded 43 bushels per acre, 516 bushels; sold one 800 pound hog, 19 months old, for \$75. Has on hand 18 hogs that will average 400 pounds—total, 7,200 pounds—for which can be realized $8\frac{1}{2}$ cents per pound, or \$612.

There are several large hog crops in our county, which, when marketed, will afford interesting reading to the admirer of big productions.

The following are a few crops sold:

Joseph Carter, of New Hanover township, killed his crop of hogs on Saturday, third instant, and they weighed as follows:

620, 720, 600, 576, 656, 594, 706, 576, 790, 566, 766, 682, 662, 616, 572, 684, 578, 618, 750, 606, 742, 658, 668, 622, 582, 852, 658, 694, 604, 638.

Average weight of the thirty, 655 1-5. Average of twenty heaviest (the number requisite to enter the contest for the championship), 690 1-10 pounds.

Weight of Mr. Carter's seventeen pigs:

302, 266, 278, 246, 264, 284, 270, 242, 196, 278, 284, 306, 218, 212, 232, 326, 226.

Average weight, 260 10-57 pounds.

Richard Harrison killed his on Tuesday, and their respective weights are given below:

510, 702, 558, 569, 556, 462, 676, 525, 560, 665, 654, 510, 579, 545, 609, 583, 493, 521, 573, 690, 632, 549, 509, 602, 544, 525, 474, 569.

Average of the twenty-eight, 569 pounds. Average of heaviest twenty, $596\frac{1}{2}$ pounds. He also killed fourteen pigs, which weighed as follows:

289, 264, 319, 239, 301, 260, 280, 251, 231, 316, 232, 260, 282, 255.

Average weight of pigs, 269 13-14 pounds. On pigs, Mr. Harrison is nearly ten pounds ahead of Mr. Carter.

Peter Bruere, near Recklesstown, also slaughtered twenty, and the weights were as follows:

542, 438, 586, 636, 536, 432, 540, 512, 461, 455, 595, 622, 519, 490, 586, 488, 468, 614, 646, 657.

The average of the whole crop was 541 pounds.

Thomas Newbold, near Juliustown, killed fourteen hogs, which weighed, respectively, 415, 517, 454, 428, 542, 433, 597, 414, 429, 412, 447, 460, 394, 390.

Average, 452 pounds.

Taylor Devinney just killed twenty hogs, weighing as follows:

977, 897, 883, 887, 881, 798, 790, 787, 755, 752, 724, 704, 695, 685, 662, 665, 650, 650, 641, 629.

The heaviest hog weighed 977 pounds. The average weight of Mr. Devinney's crop was 754 3-5 pounds. He also sold Mr. Folwell at the same time nine pigs, whose weights were as follows:

421, 407, 397, 352, 348, 341, 340, 334, 298.

Average of pigs, 359 7-9 pounds.

On Saturday last, Samuel Southard, of New Hanover township, slaughtered twenty-eight hogs. The weights were as follows:

788, 720, 680, 658, 602, 660, 618, 694, 600, 666, 642, 608, 620, 544, 540, 580, 578, 540, 570, 582, 594, 544, 506, 580, 518, 568, 570, 588.

Total weight, 16,898. Average, $603\frac{1}{2}$ pounds. Average of heaviest twenty, 625.9-10 pounds.

The raising of early lambs for the New York market is quite a large industry in our county. John E. Darnell, Joseph Lundy, Asher Kirby, John G. Cook, Isaiah A. Ballinger, and others, have marketed at this writing, March 14th, several hundred, for which they have received \$10 for each lamb.

POULTRY.

Emmor Roberts, Fellowship, raised this year, from ten turkey hens, 145 head, which he sold for \$300, or each hen produced \$30 worth of turkeys.

John and Thomas Black, near Jobstown, realized from their crop of poultry sold in April:

Eggs sold.....	\$125 00
Turkeys, hens and roosters.....	479 01 $\frac{3}{4}$
225 Capons.....	777 72
Total	<u>\$1,381 73$\frac{3}{4}$</u>

Elmer Cowperthwait, of New Egypt, recently marketed sixty capons that averaged nine pounds, for which he received twenty-five cents a pound. The heaviest pair weighed twenty-four pounds. Ridgway Foulks killed fifty-six that weighed 532 pounds, averaging nine and a half pounds. Charles M. Bruere will realize about \$800 from his crop of poultry this season.

Louisa Hardin, Springfield township, marketed fifty capons, averaging ten pounds each, 500 pounds; sold for twenty-seven cents per pound, \$135. Has about fifty more that will weigh about the same.

There have been several other crops marketed in our county ranging in weight from ten to twelve pounds apiece, or twenty and twenty-four pounds per pair. But the largest crops are yet to find a market.

Inclosed will be found a copy of the Treasurer's and Directors' report of the Burlington County Agricultural Society, which explains the condition, prospects and doings of the society so fully, it will not be necessary for me to write further about it.

Also, a list of officers and directors and time of annual fair in 1883.

All of which is respectfully submitted.

HENRY I. BUDD,
Cor. Sec. of Bur. Co. Ag. Society.

MOORESTOWN AGRICULTURAL AND INDUSTRIAL SOCIETY.

Officers for 1883.

President—Clayton Conrow, Cinnaminson.

Vice President—Wm. R. Lippincott, Fellowship.

Recording Secretary—Edward Burrough, Merchantville.

Corresponding Secretary—M. B. Comfort, Moorestown.

Treasurer—Jos. Lippincott, Moorestown.

Executive Committee—Levi Ballenger, J. M. Kaighn, Darling Conrow.

Spring fair, June 8th and 9th, Moorestown.

Annual fair, September, Moorestown.

DIRECTORS' ANNUAL REPORT.

To the Stockholders of the Moorestown Agricultural and Industrial Society:

Your directors would respectfully submit that soon after the appointment, an organization was effected by electing Clayton Conrow, President; Eli Sharpless, Vice President; J. E. Watkins, Secretary; Morris B. Comfort, Corresponding Secretary; Josiah Lippincott, Treasurer, and Levi Ballenger, William Dunn Rogers and Edward Burrough, as Executive Committee.

Your directors were of the unanimous opinion that the principal feature of the spring fair should be practical field trials of cultivating and harvesting machinery, and the development of the small fruit industry, and accordingly bent their energies toward that purpose, not, however, neglecting the other departments of the fair. To accomplish this project, permission was sought and obtained from Chalkley Zelly to allow the trial of cultivators to take place in his adjoining corn-field, which afforded every facility that could be desired for farmers and manufacturers to test the respective merits of the different machines, and at one time twelve two-horse gang plows and cultivators were at work, besides the other implements. In order to accommodate so many competitors, it became necessary to secure several teams of horses, which were furnished by the directors and others without

charge to the society. In order to test the self-binding harvesters, your directors purchased a piece of growing rye from Josiah D. Pan-coast, which, though somewhat inconvenient, was the most favorable piece obtainable. The result of this purchase was a trial of six self-binding harvesters in green rye, doing the work in such a manner as to astonish many who witnessed this operation, and practically demonstrated that the day for binding grain by hand was doomed to become one of the lost arts. In order to accomplish all this, a great deal of time, anxiety and labor were necessarily given by those in charge of these respective divisions. The arrival of a passenger train at the fair grounds, just as the harvesters were proceeding to the field, was the source of considerable loss in admission, as a large number of passengers proceeded directly to the field and never entered the gates at all. The success attending these trials was such as to warrant the management in recommending their continuance, and with that end in view, as well as to remedy, as far as possible, the losses of last year, we have seeded a portion of the fair grounds with rye, and a trial of several brands of fertilizers on marked plots will also prove of value. While the receipts from the fair were not as large as we could wish for, we are of the opinion that the advantages gained by manufacturers and farmers are such as to give us a continuance of their support, and a corresponding increase in receipts. The lateness of the season greatly interfered with the exhibits of small fruits, although these exhibits compared favorably with those of other seasons. Your directors made special efforts to have all the recently introduced strawberries and small fruits represented, but climatic influences were against us. We still believe this ought to be a special feature of the spring fair, and worthless as well as valuable varieties should also be shown.

As soon after the close of the spring fair as possible, your board met and began preparations for the fall exhibition. The success of the spring fair warranted the continuance of field trials of such machinery as were applicable to fall crops, and again your management availed themselves of the liberality of Chalkley B. Zelle, in testing manure spreaders, potato diggers, &c. Grain drills, harrows and plows were also practically tested. The other departments of the fair were all that could be wished for. The fruits and vegetables were as fine as ever witnessed in this county, or perhaps in the State. It is unnecessary for us to call attention to every department, as most of

you viewed them with satisfaction, but we do not feel that we would be doing our duty without calling attention to the exhibit of Jos. M. Kaighn & Sons, which contained 216 distinct varieties of potatoes. Edward Burrough exhibited as a competitive test twenty-five varieties. The novelties introduced here, for the first time, were the ancient and modern kitchens, and the bicycle track. A committee of ladies took charge of the modern kitchen and dispensed sandwiches and coffee, ice cream, fruit, &c. The thanks of the society are due to them for their efforts. Notwithstanding the hurried manner of the preparations, and the limited time allowed them, your directors are pleased to announce that the receipts from this source more than balanced all the expenditures of the kitchens—which proved a good success under the management of the ladies in charge, and the thanks of the society were tendered them for their kindly aid. Several merchants in Philadelphia sought advantages by giving valuable premiums for specified objects, and this not only contributed to the fair, but relieved the treasury from considerable expense, which was highly appreciated by the directors. In order to attract a larger attendance and to give publicity to the benefits arising from an institution holding two annual fairs of a character heretofore unknown in this section of the Union, a more liberal system of advertising was adopted which, in the end, must result advantageously to the society. The practicability of holding a spring exhibition of fruits, flowers, vegetables, &c., together with practical field trials of machinery, is a feature deserving the earnest encouragement of both the farmers and manufacturers. In order to meet all the demands for field trials, three methods seemed to present themselves: *First*—To remove and re-arrange the cattle sheds; *Second*—To rent a piece of land; or *Third*—To enlarge the grounds by purchase; neither of which the funds at command seemed to warrant, and we therefore have endeavored to utilize so much of the fair grounds as we considered available for the purpose. Many suggestions have been made to us by individual members, and much information obtained from other sources, that will be cheerfully given to our successors when elected. The following statement of the Treasurer will give you a correct idea of the financial standing of the society:

RECAPITULATORY STATEMENT.

Cash received from sale of stock.....	\$190 00
Cash receipts from spring fair.....	163 23
Cash receipts from fall fair.....	572 60
Cash receipts rent of ground.....	30 00
Cash balance of premiums returned.....	12 25
Cash on hand from last year.....	40 52
Amount received from all sources.....	<u>\$1,008 60</u>
Deducting cash on hand last year and amount of premium money uncalled for.....	52 77
Cash received during the year.....	<u>\$955 83</u>
Deducting value of stock sold.....	190 00
Amount received from fairs and rents	<u>\$765 83</u>

EXPENSE ACCOUNT.

Old debts paid.....	\$70 20
Amount of cash premiums paid.....	457 50
Amount interest paid.....	99 00
Advertising and printing.....	151 25
Improvement account, lumber, benches, grading, etc.....	135 70
Green rye.....	35 00
Incidentals.....	59 95
	<u>\$1,008 60</u>

From the foregoing statement it is evident that we have made considerable advance on last year's receipts, and present a cleaner ledger this year. We wish to be understood by this, in saying that less money has been received by sales of stock, and that the receipts from the gates have been larger; that aside from the improvement account and interest, the fairs were nearly or quite sustaining. While we have borrowed no money this year, and there are no unpaid bills against the society to our knowledge, it must still be apparent to every stockholder, that some way must be devised to increase the receipts and lessen the interest account, and the following suggestions have been made to your directors, which we herewith submit: First—That of a moderate charge for carriages entering the grounds at the spring fairs; Second—That exhibitors' tickets be accepted only on the first day of the fairs; Third—That no exhibitors' tickets be issued; Fourth—That an effort be made to sell the balance of the stock, and its proceeds applied to paying off the mortgage; Fifth—That the present stockholders take all the balance of the capital, in order to

pay off the mortgage. It is believed that by so doing the stock will be worth more than par. Individuals can sell their surplus shares and have proper transfers made upon the books of the company.

In conclusion, we would earnestly recommend that some plan be adopted by the stockholders at this meeting, to relieve the society from its present indebtedness. The most feasible plan we believe to be the last of the above suggestions.

All of which is respectfully submitted.

Signed on behalf of the directors,

CLAYTON CONROW,

President.

CAMDEN COUNTY.

CAMDEN COUNTY BOARD OF AGRICULTURE.

(Formerly the Farmers' Ass'n of Camden Co.)

*Officers for 1883.**President*—Ezra C. Bell, Mount Ephraim.*Vice President*—Edward S. Huston, Haddonfield.*Recording Secretary*—Geo. T. Haines, Haddonfield.*Corresponding Secretary*—Nath. Barton, Mount Ephraim.*Treasurer*—J. Stokes Coles, Haddonfield.*Board of Directors*—Theodore Hider, Blackwood; E. Burrough, Merchantville; Joel Horner, Jr., Merchantville; Amos E. Kaighn, Ellisburg; Samuel L. Burrough, Merchantville.

CAPE MAY COUNTY CROP REPORT.*By S. C. Townsend, Ocean View.*

The Agricultural Society of Cape May county has been broken up, and I have no knowledge of any new one having been organized; neither do I think it would be any use, as things now stand. About two years ago the grounds and buildings of our society were sold under foreclosure of mortgage. The mortgage was held by a man who said as long as the interest was paid he would not push the claim, but immediately after receiving his interest, which was always paid punctually, he sold out the property. The society, before this, had but about paid its way, and the burden was shouldered by a few faithful ones, the masses acting and talking as though the society and fair belonged to the board of directors. They did not ask what they could do to help the cause along, but their whole aim seemed to be to find out what they could take to the fair that would take a premium, so that they could make something out of it. Is it any wonder we failed? There is grain, produce, fruit, &c., enough raised in our county every year to make a very creditable display, but the people will not put it on exhibition for fear it would not take a premium.

CROPS.

In regard to crops, I will say that the principal ones raised are corn, wheat, sweet and round potatoes, and truck of all kinds.

The average yield of corn for the past year is about twenty-five bushels per acre; that of wheat about twelve bushels per acre, although in my own neighborhood, in Dennis township, there were thirty bushels raised on one acre and seventy-two rods. Sweet potatoes average a barrel of prime potatoes to 150 hills; some get a barrel from 100 hills, but do not consider it a fair average; sound potatoes turn about 100 bushels per acre.

There is considerable truck raised throughout our county, and would probably be much more if it was not so much trouble to get it to market. The best market we have for truck is Atlantic City, to which place it has to be conveyed in boats, which is very inconvenient.

The cultivation of sorghum is becoming one of our principal crops, and the following is a short account of the work done by the Rio Grande Sorghum Sugar Company during the past season. On September 4th, the first stalks of sorghum were placed in the crushers, and on November 15th, the last pound of sugar was made. Within that period 7,000 tons of sorghum have been worked up, from which have been manufactured 1,000 barrels of sugar and nearly as many barrels of molasses. During these ten weeks the mill has run night and day. The maximum number of tons of sorghum crushed per day has been about 200. In addition to the 1,000 barrels of sugar and 1,000 barrels of molasses, which have already found a ready market, there will be about 15,000 barrels of seed, most of which will be sold, either for transplanting (and applications for it had come from all parts of the country) or as a feed for various animals, being an admirable substitute for corn.

CUMBERLAND COUNTY.

CUMBERLAND COUNTY AGRICULTURAL AND HORTICULTURAL
SOCIETY.*Officers for 1883.*

President—David McBride, Bridgeton.

Vice Presidents—Geo. W. Sheppard, Francis R. Fithian, Jos. B. Bowen, Robert Moore.

Treasurer—Chas. H. Mulford, Bridgeton.

Secretary—Eli E. Rodgers, Bridgeton.

Executive Committee—Belford B. Elwell, Chas. B. Bowen, Lewis M. Hins, Chester J. Buck, Josiah M. Cobb, Thomas W. Williams, Joseph Glaspey, I. W. Richman, E. M. Mulford, J. Harry Smalley.

Annual fair, September 5th and 6th, at Bridgeton.

ANNUAL REPORT.

By Eli E. Rodgers, Bridgeton.

It affords me great pleasure to report our society in a flourishing condition. The people throughout the county are becoming more interested in agriculture each year, hence, take a deep interest in the welfare of the society. Crops, generally, have been very good, notwithstanding we had quite a severe drought during the summer. Our farmers are very much interested in the bulletins issued by Prof. Cook, of the Experimental Station, and think they have profited by them. Much indignation was shown when it was reported they were to be discontinued. Our society concluded last year to try the experiment of holding our fair two days, and while it proved a financial success, I am sorry to say the fair was not as good as usual, as the opposition was so strong that many would not contribute. We expended between \$1,200 and \$1,500 in the way of permanent improvements during the last year, and we expect to erect permanent buildings and cattle sheds this present season at a cost of about \$4,000, and again hold the fair two days. Our membership at present is 681 annual members and forty-five life members.

We are progressing in Cumberland county, and hope in the not far distant future to cope with the very best agricultural societies in the State.

ESSEX COUNTY.

ESSEX COUNTY BOARD OF AGRICULTURE.

Officers for 1883.

President—Isaac S. Crane, Livingston.

Treasurer—M. H. Canfield, Caldwell.

Secretary—J. H. Baldwin, Livingston.

Board of Directors—Marcus Y. Baldwin, Rufus F. Harrison, Wm. Diecks, J. H. M. Cook, A. W. Teed.

CROP REPORT.

By J. H. Baldwin, Livingston, N. J.

Essex, the most populous county in the State, with a small area in square miles, is known rather for the variety and extent of its manufactures than for its agricultural products, and yet it occupies an important position in the latter regard. The main portion of its population is to be found in the cities of Newark and Orange, and in the township of East Orange. The balance of the county, comprised in the townships of Belleville, Franklin, Bloomfield, Montclair, West Orange, Caldwell, Livingston, Milburn, South Orange and Clinton, are farming communities.

Farming, here, however, is carried on differently than in most places. The farms are small and managed to suit the locality. Long ago it was found impossible to compete with the Great West in grain growing, and, therefore, but little more is raised than suffices for home use, and the attention of the husbandman has been directed to other branches of the business. The demand in the cities and towns for large quantities of pure, fresh milk, has caused the milk raising to advance to the first place in the attention of the farmers, while vegetable trucking and fruit growing have assumed important places. The accessibility of the market has made the latter especially practicable and profitable, as the products are quickly placed in the hands of consumers, and the very best prices are easily obtained, while neither freights nor commissions have to be paid upon them.

Milk is our farmers mainstay. It brings a prompt money return

in winter and summer alike, and is more or less profitable, according to the ability of the individual under whose management it is conducted. Two plans are adopted for the sale of the milk. Either it is sold in bulk to the wholesale dealer, or it is retailed directly to the consumer by means of the delivery wagon. The latter plan involves the most work, and a little more capital, but it is by far the most remunerative. Those who sell to the wholesale dealers are under many disadvantages. During the summer months they are obliged to accept a price for their milk that little more than pays for its production; but during the winter months a good price is obtained.

The low price of milk in the summer-time is a thing that the raisers have tried persistently to overcome, but every attempt has thus far been unsuccessful. It seems to be especially unjust because the consumer is not benefited. While the wholesale price is two and a half cents per quart, the consumer is obliged to pay eight cents, and the wholesale dealer pockets a handsome profit at the expense of the raiser. The cause of this, it is alleged, is that a large quantity of skim milk is put on the market in the summer months, and, in spite of the laws to the contrary, it is sold for pure milk. In this way the market becomes overstocked, and the milk raisers are obliged to accept a low price for their product or have it left upon their hands to spoil. Plans of various kinds have been proposed to overcome this summer low rate, but all to no purpose, and it is believed that nothing but the positive prohibition of the sale of skim milk will protect the raiser of the good article and the consumer from imposition.

In Essex county there are about 4,000 milch cows, but the yield of milk per cow, on the average, is small. Considerable young stock is raised, but the most of the cattle are bought outside of the county. Those who do raise young stock do not make a study of increasing the milk product to as great an extent as possible.

The present year was favorable to early maturing crops. Wheat, oats and rye yielded twenty-five, forty, and twenty-three bushels per acre respectively. Corn suffered severely from the drought, and yielded only about eighteen bushels per acre. Late potatoes were almost a failure.

During the year past extensive experiments were made in the use of kanite as a fertilizer. Where it was applied by sowing broadcast the results were favorable, but where it was used in hill and drill it proved to be too powerful, and did about as much harm as good.

The meetings of the County Board of Agriculture, which are held in connection with the Livingston Grange, are productive of much good. Free discussions are held on subjects of interest, and they are handled in such intelligent manner as to prove highly instructive and entertaining. The meetings are well attended and the membership is increasing. At the present time there are thirty-nine active members enrolled, with prospects of a large increase during the year.

GLOUCESTER COUNTY.

GLOUCESTER COUNTY BOARD OF AGRICULTURE.

Officers for 1883.

President—Samuel Moore, Harrisonville.

Vice President—George H. Gaunt, Paulsboro.

Treasurer—David A. Adams, Mickelton.

Secretary—Chalkley Duell, Wenonah.

Board of Directors—John B. Batten, Swedesboro; Paul Avis Harrisonville; Wm. A. Mullen, Paulsboro; John Gaunt, Mullica Hill; Chas. Shoemaker, Mantua; B. T. Sickler, Williamstown; Ellison Horner, Mullica Hill.

CROP REPORT FOR 1882.

The Directors of Gloucester County Board of Agriculture would respectfully submit the following report:

Having organized so late as January 25th, they are unable to give data as full as they hope the coming year.

The crops produced in this county are varied, the western end being almost exclusively devoted to truck farming, viz.: sweet potatoes, melons and early garden stuff, while the middle and eastern parts are devoted to the production of grass, grain, feeding stock and the production of milk.

In the section of the county devoted to raising grain, the corn crop averaged about fifty bushels to the acre, the crop not heavy.

The average wheat crop, extra good this year, would be twenty-five bushels, or over, in the wheat section. Charles Heritage, of East Greenwich, raised on eight acres 332 bushels, Fultz, an average of forty-one and one-half bushels, many fields averaging thirty to thirty-five bushels.

George Horner, of Harrisonville, sold milk from twenty grade cows to creamery, also sold young calves to about \$1,700 worth, besides supplying a family of ten with milk and butter.

There is considerable beef fattened in the county, but not so many as formerly, many having gone into milk production. There are many

farmers engaged in fattening calves, of which this county is not ashamed.

A large quantity of pork is produced in parts of the county, many farmers producing from 5,000 to 10,000 pounds.

The sheep industry is directed to lambs, for which Gloucester county stands well in Philadelphia markets.

There is considerable interest being developed in the poultry business all over the county, but, having no data, cannot give particulars.

The sweet potato crop this year has been a good one, yielding about 200 bushels per acre.

The melon crop has been excellent the past year, growers realizing from \$60 to \$100 per acre.

The early white potato crop was good, farmers receiving fair prices. Late crop, generally speaking, a failure.

Early tomatoes, good crop, good prices. Late tomatoes, middling crop; damaged by September storm; brought fair prices.

The fruit crop, as a general thing, was a complete failure.

Fertilizers generally used are manure, marl and lime. Some phosphate used, but not to a very great extent.

HUNTERDON COUNTY.

HUNTERDON COUNTY AGRICULTURAL SOCIETY.

Officers for 1883.

President—Jonathan Higgins, Flemington.

Vice Presidents—C. F. Fisher, Ringoes; J. L. Jones, Flemington.

Recording Secretary—J. L. Connet, Flemington.

Corresponding Secretary—W. C. Parker, Flemington.

Treasurer—John H. DeMott, Flemington.

Board of Directors—F. S. Holcombe, S. S. Stout, Jos. Haines, A. Probasco, John B. Hopewell, J. M. Duckworth, Michael Shurts, J. H. Rockafellow, Hiram Moore, David D. Schomp, Aug. Blackwell, David Van Fleet, Louis A. Exton, O. B. Davis.

Annual fair, September 25th, 26th and 27th, at Flemington.

CROP REPORT.

By F. S. Holcombe, Lambertville.

I herewith present a partial description of the general yield of crops in Hunterdon county for the past year, and the prospects for winter grain and fruit for the present year. The yield of wheat, as far as I can ascertain, was a fair average crop, some farmers reporting thirty bushels per acre. E. J. Strong, of East Amwell, reports his crop at twenty-eight bushels, and rye at twenty-five bushels per acre. Strong harrowed his wheat and rye in the spring twice over. Charles Wilson, of West Amwell, reports his crop at twenty-five bushels per acre, with home-made phosphate and no manure. The rye crop was generally an average. Oats, good. Buckwheat, not as much sown as formerly, but about half a crop as far as sown. Corn crop, not more than a half crop throughout the county; early planting the best, as a severe rain storm and wind blew the later planting down and injured it very much by mould, and preventing the ears from filling out, injuring the fodder somewhat. Early planting of potatoes good; not so many bugs as year before; late planting, on account of dry weather, was almost a failure. At the present time, good potatoes are worth from seventy-five to ninety cents, in trade, at our stores.

Grass and hay were a good crop. Owing to the dry weather the previous year killing the roots, and the dry weather the present year shortening the growth, the crop was gathered in such good order that its feeding qualities are much better than usual, a less quantity being sufficient to keep the stock.

The crops of small fruits were fair, except currants and cherries. The prices for berries were good in our home markets, excepting in the rush of ripening, when strawberries were low in price. Raspberries and blackberries maintained a good price all the season, bringing from fourteen to twenty cents per quart for cultivated.

Apple crop was a good half crop throughout the county, some farmers having none of any account, while others had an abundant crop, owing to the quality of soil in which the orchards were planted. In East Amwell township, some of the farmers realized from 500 to 1,000 barrels each. In Raritan township, A. J. Holcombe, R. Thatcher & Son, G. B. Stothoff, and others, had large crops, and all around our county seat, the merchants tell me, there was more than half a crop, worth at this time from \$1.00 to \$1.25 per bushel.

PEACHES.

I hardly know how to describe the peach crop throughout the county, it was so immense. Many farmers had to let them rot on the ground for want of baskets and men to pick them. Some fed the dropped peaches to their hogs, while others took them to the still and had them made into peach whiskey. To give you some idea of the crop, I will give you the shipments from some of our railroad stations.

	Baskets Shipped.
On the South Branch Railroad—	
Flemington and Three Bridges stations.....	201,657
Easton and Amboy Railroad—	
Lebanon.....	111,100
Pattensburg	20,000
Midvale	40,000
Stanton.....	80,000
	<hr/> 251,100
Central Railroad—	
High Bridge.....	50,000
Annandale.....	10,000
White House.....	75,000
Junction	26,000
	<hr/> 161,000

Belvidere Road—		Baskets Shipped.
Stockton		21,000
Lambertville.....	5	16,547
Bools Island, Frenchtown, Milford and Reiglesville, I have not got estimated.		
Ringoes, on Flemington Branch, estimated.....		10,000
Neshanic, on South Branch Road, estimated.....		20,000
East Amwell shipped on the Bound Brook Road—Asher Higgins had 7,000 baskets; perhaps within bounds from this station.....		
		30,000

In the upper part of Hunterdon county, in the peach district, I have failed to get the amount. Thousands of baskets were carted by the farmers through Pennsylvania, finding a better market for the early peaches than to ship them to the city. One farmer with an evaporator in his orchard dried 200 bushels—two car loads of peaches of 450 baskets. Each were shipped from Lambertville to Cincinnati, the freight being \$176 on each car.

The prices have been very satisfactory to the farmers. I am informed that King Pyatt sold \$1,800 worth from nine acres. W. B. Demott sold \$1,000 worth from three acres. Three of our prominent merchants in Flemington sold the following, as reported to me, of empty baskets: Wm. H. Fulper, 170,000 baskets and 200,000 covers; Anderson Nevius, 50,000 baskets and 100,000 covers; Richards & Sutphin, 15,000 baskets and 25,000 covers. The Beecher Manufacturing Company, located at Flemington, although not getting their building up in time to furnish the supply of farmers, made and sold 80,000 baskets, making a home market for timber, and furnishing employment for a large number of hands. Thousands of baskets of peaches were retailed every week in our numerous villages throughout the county, and in our sister counties. You may safely say a million baskets were raised and disposed of in our county, bringing in to the farmers over a half million of dollars. Some of the peach growers say I am under the estimate rather than above it.

PEARS.

Pears were a general failure, excepting a few old standard trees that bore abundantly, the names of which nobody knows.

MILK.

We have two creameries in our county, one located in Sergeantsville, the other at Locktown, both in Delaware township, and only four

miles apart, doing a good business, and having a ready sale for all the butter and cheese made. The half-skims are shipped to the Southern States. Our county is selling large quantities of milk, several farmers putting it in quart air-tight cans and shipping to Jersey City, while others ship in large cans. Enormous quantities are shipped from Whitehouse station, on the Central railroad. One creamery at Little York and three creameries in Lebanon skim the cream, and ship to New York both cream and milk as high as 100 cans of forty quarts per day, and others doing the same business, but cannot give the figures.

POULTRY.

Not as large a crop of turkeys as last year, but chickens abundant. J. S. Wilson, of Delaware township, raised 700 chickens; he furnishes W. H. Force, of the county-house with \$150 worth of early chickens, shipping some to New York, and getting from twenty to twenty-eight cents per pound, alive. John Horn, of West Amwell, shipped over 1,600 pounds of poultry at one time, getting in return \$340, while others have done equally as well. The prices have been good all the season, bringing in our country towns from fourteen to sixteen cents for chickens, and fifteen to eighteen cents for turkeys.

VEGETABLES.

Vegetables are being raised in our county for market more and more every year, and find a ready market at home, Clark T. Hunt, of Stockton, being the largest raiser in my vicinity. Early, medium and late varieties of cabbage, onions, tomatoes, cantaloupes, also sweet corn and strawberries for Lambertville market; cantaloupes and cabbage shipped up the Belvidere road to Seranton, Wilkesbarre, and other places; he also ships green tomatoes, the last two years, South. The cabbage crop this year produced largely, some of the heads weighing fourteen pounds, the early and medium varieties bringing three cents per pound.

TOMATOES.

We are too far from market to ship tomatoes to the city. We have one canning factory in our county, and I will give you the figures. It is carried on by John H. Butterfoss, in Lambertville. He has put

up this year 388,000 cans. He bought of the farmers, from one to six miles from Lambertville, 27,000 bushels of tomatoes and 3,000 bushels of apples, making 850 tons of goods.

Stephen B. Smith, C. O. Holcombe, Dr. G. H. Larison, of Lambertville, and Harvey Finch, of Flemington, keep a careful record of rain-fall and temperature of weather, but I am not able to give you the figures.

The present prospect of the crop of fruit another year, in regard to peaches, is excellent, although I hear of the English sparrows eating the buds of some orchards, and I know they will destroy the blossom of the pea crop if they have a chance. Winter grain, so far, very good prospect.

CROP AND SOCIETY REPORT.

By W. C. Parker, Flemington, N. J.

The condition of our society for this last year may be briefly stated as follows :

There has been no material change in the condition of our society, except in its finances. Owing to the severe storm which prevailed all over this section, and the threatening weather which continued for the first two days in the week of our meeting, the attendance at our fair was largely decreased, and many kinds of exhibits were prevented from reaching us. Had it not been for the unpleasant weather we would have had about double the attendance which we had. As it was, we fell behind about \$250 for the year, and had to increase our indebtedness by that sum.

The crops in our county and section for the last year may be characterized, generally, as follows :

Wheat, very fine in character and yield; corn, about one-half a crop; oats, not quite up to the average; rye, good; hay, average; buckwheat, light. The fruit crop has been only medium, except peaches, which have been fine and yielded largely. In stock, there has been considerable improvement in the character of the stock fattened for market, it having improved in weight and fineness of grain. For dairy purposes, the Jersey stock has grown in favor, and the quantity of fine dairy stock has largely increased; other kinds of stock have improved, but in a less marked degree.

The farmers are becoming more interested in the new questions which have arisen in regard to the qualities of soil, the best methods of fertilizing, &c. They are studying the scientific questions of their business, and, I think, are profiting considerably by the sources of information which are now open to them through the influence of the State Board of Agriculture and other organizations. They are also more interested in studying the agricultural papers.

MERCER COUNTY.

PRINCETON AGRICULTURAL ASSOCIATION.

*Officers for 1883.**President*—James Van Deventer, Princeton.*Vice President*—James H. Bruere, Princeton.*Secretary*—Henry E. Hale, Princeton.*Membership*—Seventeen.

SOCIETY AND CROP REPORT.

By Henry E. Hale, Princeton.

The Princeton Agricultural Association has held its monthly meetings as usual during the year 1882.

At these meetings it is a part of our regular business to have an essay read on a subject previously agreed upon. Also to inspect the stock and premises where we meet, and to answer such questions as may be proposed by the members.

The following are a few of the subjects that we have discussed during the past year:

“The different varieties of corn, and methods of planting the same.”

“Fertilizers,” including the question, “How shall we best economize the fertilizers of the farm?”

“Responsibility for damages by fire spreading to adjoining land.”

“The condition of crops.”

“Roads.”

“Some diseases of animals.”

“Getting rid of wild carrots.”

“Shall we raise more of the large fruits, and less grain?”

“Is the protective tariff a benefit to farmers?”

This occasioned a most interesting discussion, but did not settle the question.

“How shall we procure labor for our farms?”

Each subject was discussed by the members with interest, and I may say, in some cases, with good results.

The crops in Mercer county were good in most respects.

Hay, oats and wheat, yielded well.

Corn grew and cared well, but was blown down, and extra help being scarce, much of the corn was injured before it was harvested.

Automatic binders, for use in wheat and oats, are coming into use in this vicinity more and more every year.

The crops of small fruits were good.

Apples only produced a moderate crop.

Peaches were uncommonly abundant, but not extra in quality.

Quinces did unusually well.

Most varieties of pears were a failure; the Seckel, however, bore fruit.

Plums did better than usual.

A creamery was started in this vicinity, on the Trenton turnpike, last April, and ran through the summer, making a large amount of excellent butter and cheese. It did not run in midwinter, but is expected to start early in the spring.

I think I express the opinion of every member of our association, when I say that we value highly the work of the Experiment Station, and would view with regret any measure tending to destroy or hamper its efficiency. Its bulletins are read with interest, and its analyses are looked upon as our only safeguard in the purchase of fertilizers.

HOPEWELL FARMERS' CLUB.

Officers for 1883.

President—A. L. Holcombe, Hopewell.

Vice President—J. A. Miller, M.D., Hopewell.

Treasurer—J. M. Dalrymple, Hopewell.

Secretary—W. I. Phillips, Hopewell.

Membership—Twenty.

SOCIETY AND CROP REPORT.

By J. M. Dalrymple, Hopewell.

With regard to agricultural features of this section, I think that I may say that the past season was a favorable one, especially the peach crop, which was abundant; 74,694 baskets of peaches were shipped to

market from Hopewell station last fall ; small fruits, crop very moderate ; wheat crop, very fair ; corn crop, considerably damaged by heavy rains late in season. Nevertheless, we have reports from some of our members that from seventy-five to eighty-six bushels per acre were raised.

Prof. Geo. H. Cook has, for several years past, annually addressed our club, and at these meetings we have had good attendance ; his lectures have been very interesting and instructive to farmers.

MIDDLESEX COUNTY.

MIDDLESEX COUNTY FARMERS' CLUB.

President—J. V. D. Christopher, New Brunswick.

Vice President—Geo. W. De Voe, Old Bridge.

Secretary—Edward Phelps, New Brunswick.

Treasurer—A. D. Newell, M.D., New Brunswick.

Executive Committee—Samuel Blist, Abram N. Conover, J. R. Williamson.

MONMOUTH COUNTY.

MONMOUTH COUNTY AGRICULTURAL SOCIETY. 9

Officers for 1883.

President—Wm. Spader, Matawan.

First Vice President—Geo. W. Brown, Long Branch.

Second Vice President—Chas. D. Hendrickson, Keyport.

Secretary—Jas. J. Conover, Freehold.

Treasurer—C. A. Bennett, Freehold.

Board of Directors—Wm. Spader, Edward Martin, John H. Denise, N. S. Rue, Hal. Allaire, Lafayette Conover, Geo. W. Brown, Henry Campbell, Wm. H. Davis, Edgar Schenck, C. H. Butcher, John R. Dubois, Geo. F. Ward, C. D. Hendrickson, J. V. N. Willis, John B. Conover, Wm. W. Taylor, S. T. Hendrickson, A. Conover, Thos. E. Morris.

Annual fair, September, Freehold.

CROP REPORT.

By Jas. J. Conover, Freehold.

The corn crop, owing to the long and severe drought, was only medium. Wheat crop extra good. Several crops which I have had reported averaged over forty bushels to the acre. Mr. John H. Denise had a few acres that yielded forty-eight bushels of Fultz wheat to the acre.

Hay crop, medium to good. This crop is becoming one of the most profitable crops our farmers can raise, owing to the very light expense incurred in preparing it for market. Our shore towns now furnish a remunerative market for all of surplus crop; very much of it being sold and delivered for a larger price than can be obtained in our large and flourishing cities.

Apple and pear crops almost a failure; grapes and small fruits, an average crop.

MELONS.

The water and citron melons has become a very profitable crop to our farmers who live near water communication to New York. Mon-

mouth county boasts of producing larger and better melons than any other portion of our State.

Report of J. V. Burt's watermelon crop: Total net receipts from five and one-quarter acres of watermelons, \$1,021.35; in addition to the above he contributed fifty of the most valuable ones to our county exhibition, and forty-two to the State fair, worth, at least, \$25 more; they were planted in hills ten feet apart each way, and only one vine allowed to each hill.

POTATOES.

T. Vanderveere DuBois, of Marlboro, raised from 3.33 acres 992 bushels of potatoes; best acre yielded 297.10 bushels; one-half of an acre of the above plot was washed or gullied land. The yield would have been much larger had not a very severe drought prevailed about the time of the setting of the young potatoes.

The above crop was grown and fertilized with one ton of Walton and Whann's raw bone superphosphate (*Plow Brand*) applied in the row at the rate of 300 pounds per acre, the balance of the ton was sown broadcast, no other manure being used.

ONIONS.

Benjamin Griggs, of Marlboro, harvested from one-half acre of land forty-eight and one-half barrels of onions.

SOCIETY REPORT.

The stockholders of the Monmouth County Agricultural Society held their annual meeting in Rossell's hall, January 18th, and was more largely attended than usual.

The interest manifested in the proceedings by those present indicated a revival of interest in the affairs of the society. A number of young men farmers and others have been added to the management, and the discussions looked to the introduction of new and more energetic measures.

The treasurer and finance committee reported that the total receipts for the year were \$4,219.60, and the expenditures were \$4,259.43, making a deficiency of \$39.83. About \$500 of this amount were spent in permanent improvements.

The property of the society includes the following :

Twenty acres of land, estimated at.....	\$1,000 00
Grand stand.....	1,800 00
Exhibition building.....	3,000 00
Secretary's and treasurer's office.....	400 00
	<hr/>
	\$9,200 00
Deduct debt.....	4,400 00
	<hr/>
	\$4,800 00

Our exhibition was one of the best ever held by the society, as regard the quality and quantity of articles on exhibition. The attendance was good, but not as large as on some previous occasions.

MORRIS COUNTY.

MORRIS COUNTY AGRICULTURAL SOCIETY.

President—B. C. Guerin, Morristown.

Secretary—

Annual fair, September 11th, 12th, and 13th, at Morristown.

MORRIS AND ESSEX MILK RAISERS' ASSOCIATION.

Officers for 1883.

President—S. H. Burnett, Hanover.

Treasurer—Geo. Cook, Hanover.

Secretary—Abram Squire, Hanover.

SALEM COUNTY.

WEST JERSEY AGRICULTURAL AND HORTICULTURAL ASSOCIATION.

Officers for 1883.

President—Omar Borton, Woodstown.

Vice Presidents—John W. Dickinson, Robert Van Meter, John Haines, M. J. Paulding, M.D.

Treasurer—L. A. D. Allen, M.D., Woodstown.

Secretary—James D. Lawson, Woodstown.

Board of Directors—Chas. D. Coles, Joshua Reeves, S. T. Lipincott, Robert Hewitt, Isaac C. Du Bois, Chas. R. Burt, George Coombs, Israel A. Hewitt, Barclay Edwards.

Annual fair, September 12th and 13th, at Woodstown.

CROP REPORT.

By James D. Lawson, Woodstown.

Our crops this last year were very good, wheat, in particular, many fields yielding thirty and thirty-five bushels per acre. Potatoes were very large. I saw, in one instance, where twenty-two potatoes made one bushel. I think one bushel was sent to Prof. Cook for State farm. Our creamery is successful. For the year ending December 31st, 1,860,500 pounds were received. In consequence of our creameries, milk and butter both have advanced in price, and held it throughout our warmest season.

Farms, both for rent and sale, have advanced in price. Our stock through the county is improving. Dr. J. M. Paulding has a fine herd of Jerseys; Henry W. Austin, a fine herd of Holsteins.

We have but one silo within three miles of us. Last year the dry weather was so severe they failed to fill it. It is now filled, and the owner, Col. John W. Dickinson, says it answers every purpose.

Fodder cutters this last year seem to be getting into general use and giving good satisfaction.

Our exhibition this last year was fully as good as usual. Our stock, not as much of it, but better in quality, the association spend-

ing quite a sum for the improvement of cattle stalls. Our receipts were larger this year, and this next fall we will have the cars running to the grounds. Our treasurer reports quite a balance on hand. We will improve the grounds and add to our premium list.

I write this much to show you our object to stimulate our farmers to improve their stock and crops.

SOMERSET COUNTY.

SOMERSET COUNTY AGRICULTURAL SOCIETY.

Officers for 1883.

President—Col. A. S. Ten Eyck, Somerville.

Vice President—Calvin Corle, Neshanic.

Treasurer—L. R. Vredenberg, Somerville.

Secretary—Wm. S. Potter, Somerville.

General Superintendent—Adrian Olcott, Weston.

Board of Directors—Adrian Olcott, A. S. Ten Eyck, John R. Lewis, Daniel D. Stelle, Peter Dewitt, H. A. Verdenbeek, David C. Voorhees, Stephen O. Horton, Albert Voorhees.

Annual fair, October 2d, 3d, 4th and 5th, at Somerville.

SUSSEX COUNTY.

SUSSEX COUNTY AGRICULTURAL SOCIETY.

ORGANIZED 1880.

Officers for the Year 1883.

President—Hon. Thomas Lawrence, Hamburg.

Vice Presidents—Hon. Lewis J. Martin, Deckertown; Albert Puder, Andover.

Secretary and Treasurer—Henry Huston, Newton.

Directors—Albert Puder, Gilbert I. Grover, Hon. Thomas Lawrence, Gilbert Ingersoll, Charles L. Inslee, Joseph Warbasse, Garret S. Van Blarcom, Jacob E. Hornbeck, Peter D. Smith, David R. Warbasse, Peter Smith, John Huston, Henry M. Ward, Jacob J. Smith, Mahlon Budd, Jacob Swartwout.

Executive Committee—Hon. Lewis J. Martin, William S. Hardin, John P. Wilson, Joseph Warbasse, Zachariah H. Price, Henry M. Ward, Seeley Howell, Godfrey F. Hawk, William H. Hart.

Annual fair, October, Newton.

UNION COUNTY.

UNION AND MIDDLESEX COUNTIES MUTUAL AGRICULTURAL
ASSOCIATION.*Officers for 1883.**President*—John I. Holly, Plainfield.*Vice Presidents*—Nathan Robins, O. T. Waring, J. S. Vosseller.*Treasurer*—J. W. Johnson, Plainfield.*Secretary*—E. J. Waring, Plainfield.*Board of Directors*—John I. Holly, J. V. D. Christopher, A. H. Smith, Samuel Blish, John S. Clark, J. W. Johnson, E. J. Waring, Eugene A. Gross, Job Winans, E. C. Pearson, Nathan Robins, W. T. Ames, O. T. Waring, J. S. Vosseller, Smith W. Laing, Bergen Vanderhoven, John C. Meyer.

Annual fair, September 25th to 29th, Plainfield.

UNION COUNTY FARMERS' CLUB.

*Officers for 1883.**President*—N. W. Parcell, Elizabeth.*Vice President*—E. P. Beebe, Elizabeth.*Secretary*—Dennis C. Crane, Union.*Executive Committee*—Walter Stabler, J. L. Benedict, Moses O. Winans.

CROP AND CLUB REPORT.

By Dennis C. Crane, Union.

During the past year the club has held, at the court house, Elizabeth, twelve meetings, three at the farms of members and one picnic on Springfield mountain; twenty-two members have attended, besides some visitors. Average attendance, eight.

Prof. Geo. W. Cook gave us a lecture on ensilage last winter. It was especially interesting to our milk raisers.

We find it difficult to sustain meetings through the spring, summer and fall months, while farm work requires so much attention, but in the winter we have well-attended and profitable meetings. The afternoon meetings at the farms of members have had a beneficial effect, upon not only the visitor but visited.

Our library is increasing in size and value, and is read by many. We wish to acknowledge the receipts of the State Board reports; we have read them with great satisfaction and profit. Some of the subjects which we have considered at the meetings are "Pruning Trees and Vines;" "Utilizing Mountain Land;" "Underdraining;" "Top-dressing Meadows;" "Growing Fodder Crops;" "Commercial Fertilizers and other Manures;" "Roads and Road Making;" "Spring Planting;" "Planting and Cultivation of Corn;" "Small Fruits;" "Insects;" "How shall we Interest the Young in Farming," and "Farm Conveniences."

Mr. Noah W. Parcell is appointed delegate to the State Board, and Mr. J. L. Benedict, alternate.

Crops in our county during the past year have been sixty, but not a hundred-fold, some suffered from the continued dry weather of the summer. The earliest potatoes, on rich, light soils, were good, while the late crop turned out poor, and those left in the ground until after the heavy rain watersoaked and rotted badly. Corn was an average crop; late planting did the best. The heavy rains in September, and continued wet, cloudy weather the fore part of October, delayed fall work. The cutting of corn, sowing of rye, timothy, &c., deferred the husking, so that much of it was done in December. Early sown timothy and grain has taken well, and is promising; a large acreage has been sown. The hay crop was better than was feared in the spring, the drought of year before last having killed out the better grasses. Considerable oats was sown and the crop was very good, also rye was good; large yields are reported of both. But little wheat is sown in the county.

Some of our milk raisers have built silos, and are much pleased with their experience. Mr. Warren Ackerman, of Scotch Plains, and Mr. Joseph Cory, of Westfield, are the most conspicuous advocates, and practice on the largest scale this system of storing fodder. There was a good crop of small fruits, medium crop of apples and pears, and but few cherries and peaches.

WARREN COUNTY.

WARREN COUNTY FARMERS', MECHANICS' AND MANUFACTURERS'
ASSOCIATION.*Officers for 1883.*

President—Geo. K. McMurtrie, Belvidere.

Treasurer—Israel Harris, Belvidere.

Secretary—J. T. Kern, Belvidere.

Board of Directors—Asa Kinney, Jos. Fisher, Nelson Vliet, G. K. McMurtrie, Abram McMurtrie, Jas. Cyphers, Isaac Brandt.

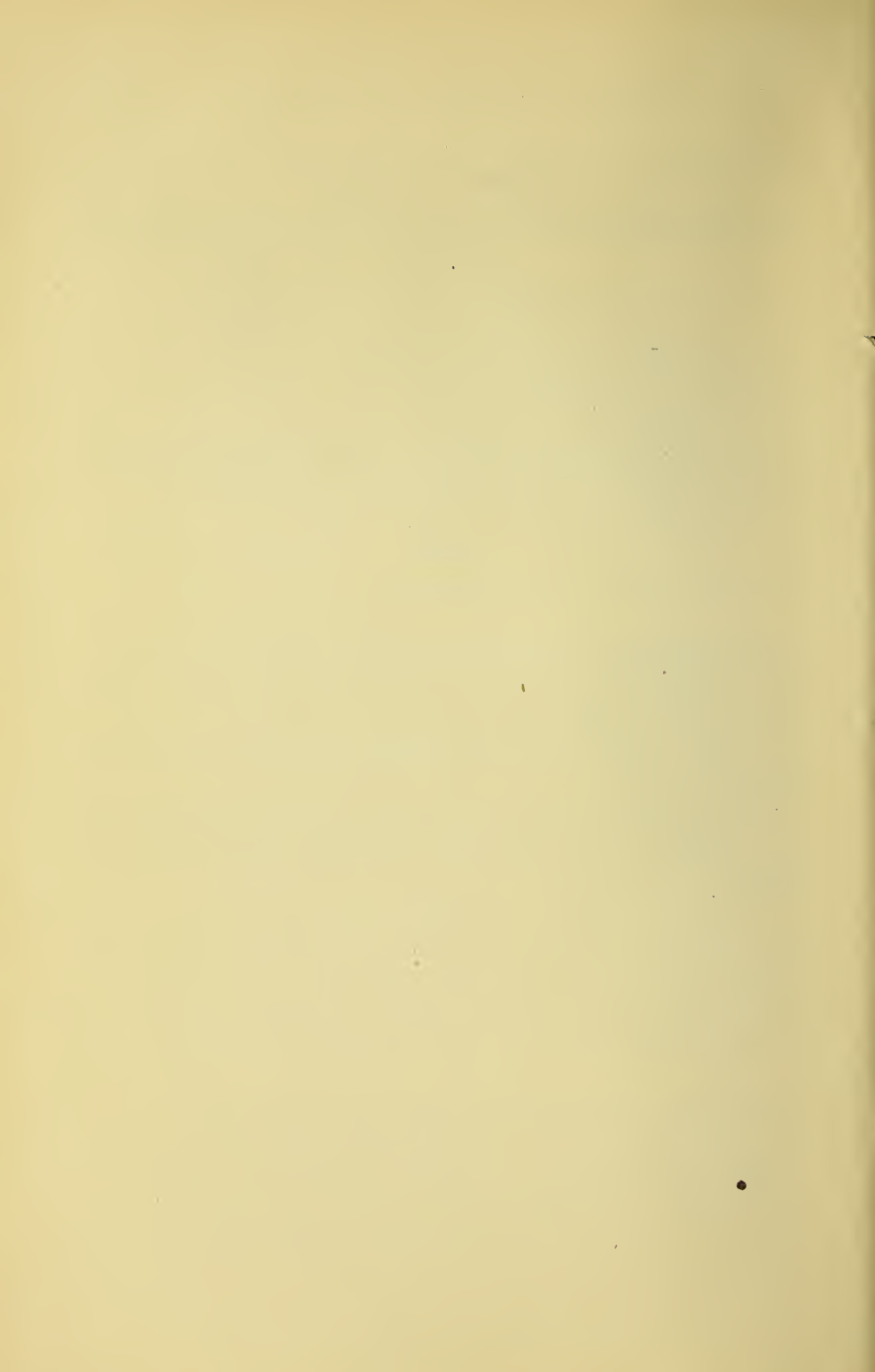
REPORT.

By J. T. Kern.

The association did not hold any fair for 1882, owing to the fact that the grounds of the association needed cultivation and seeding down, which was done.

The time of holding our next annual fair has not as yet been determined; but the regular time of holding it has been on the first Tuesday in October.

The crops of our county, the past year, were generally good, with the exception of corn, which was materially injured by the dry weather.



CONTENTS.

CONTENTS.

	PAGES.
Officers of Board for 1883.....	3
President's Address.....	5-19
Executive Committee's Report.....	21-23
Diseases of Animals.....	25-28
Circular F.....	29-36
Prevention of Contagious Diseases.....	32
Inoculation for Pleuro-pneumonia.....	32
Anthrax, or Splenic Fever.....	34
Texas, or Southern Cattle Fever.....	34
Veterinary Surgeons' Reports.....	37-47
Thomas B. Rogers, D.V.S.....	37
John A. McLaughlin, D.V.S.....	41
William B. E. Miller, D.V.S.....	42
J. W. Hawk, D.V.S.....	45
C. K. Dyer, D.V.S.....	46
Process by which Fertility is Restored to a Soil Exhausted by Croppings....	49-56
Sir John Bennet Lawes, Sketch of Life of.....	57-62
Carp Culture.....	63-71
Strawberry Culture.....	73-81
Watering.....	79
Damage by Insects.....	80
Poultry.....	83-86
Poultry Crop on New Jersey Farms.....	87-91
Potato Culture.....	93-96
Fertilizers.....	97-98
Potato Culture in Cumberland County.....	99-101
How Protection Protects the Farmer.....	103-118
Farm of the New Jersey Agricultural College.....	119-140
The Weather and the Seasons.....	119
Temperature at College Farm.....	121
Rain-Fall at New Brunswick.....	121
Crops.....	122
Stock.....	124
Experiments.....	124-140
Oats.....	125
Indian Corn.....	125
Sorghum Sugar Cane.....	126
New Varieties of Wheat.....	131
Green and Dried Fodder Corn.....	132
Ensilage.....	132
Sorghum Seed for Feeding.....	137

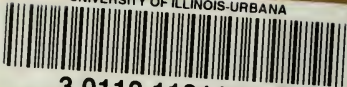
	PAGES.
Address by Hon. James Pollock.....	141-153
Goffart System of Ensilage.....	155-162
Minutes of Annual Meeting.....	163-195
Members present.....	165
Reports of State and County Societies.....	167-175
State Horticultural Society.....	167
West Jersey Cattle Association.....	167
Atlantic County Board of Agriculture.....	167
Burlington County Board of Agriculture.....	167
Burlington County Agricultural Society.....	167
Camden County Farmers' Association.....	168
Cumberland County Agricultural Society.....	174
Vineland Agricultural Society.....	174
Gloucester County Board of Agriculture.....	174
Hunterdon County Agricultural Society.....	174
Mercer County Agricultural Society.....	175
Hopewell Farmers' Club.....	175
Monmouth County Agricultural Society.....	175
Salem County Agricultural Society.....	175
Conference of Board with Members of the Legislature.....	177
Discussion on Fertilizers.....	180
Discussion on Ensilage.....	190
Report of Hon. William Parry.....	192
State Agricultural Society.....	197-213
Officers.....	199
Secretary's Annual Report.....	200
Treasurer's Report.....	209
Statement of Awards.....	211
American Cranberry Growers' Association.....	215-231
Officers.....	217
Statistical Report.....	219
The Course of Trade.....	222
Standard Measure.....	223
Cranberry Bulletin.....	226
Reports of Committees.....	228
State Horticultural Society.....	233-240
Officers.....	235
Agricultural and Horticultural Societies.....	241-305
Officers of State Grange.....	243
List of County Granges.....	245
List of Subordinate Granges.....	246
Report of State Grange.....	249
Report of New Jersey Breeders' Club.....	250
Report of New Jersey and Eastern Bee Keepers' Association.....	251
Atlantic County—	
Atlantic County Board of Agriculture.....	253
Egg Harbor City Agricultural Society.....	253
Crop Report.....	253

Agricultural and Horticultural Societies— <i>Continued.</i>	PAGES.
Bergen County—	
Bergen County Agricultural Society.....	255
Burlington County—	
Burlington County Board of Agriculture.....	256
Moorestown Agricultural and Industrial Society.....	275
Camden County—	
Camden County Board of Agriculture.....	280
Cape May County—	
Crop Report.....	280
Cumberland County—	
Cumberland County Agricultural and Horticultural Society.....	282
Essex County—	
Essex County Board of Agriculture.....	283
Gloucester County—	
Gloucester County Board of Agriculture.....	286
Hunterdon County—	
Hunterdon County Board of Agriculture.....	288
Mercer County—	
Princeton Agricultural Association.....	294
Hopewell Farmers' Club.....	295
Middlesex County—	
Middlesex County Farmers' Club.....	296
Monmouth County—	
Monmouth County Agricultural Society.....	297
Morris County—	
Morris County Agricultural Society	299
Morris and Essex Milk Raisers' Association.....	299
Salem County—	
West Jersey Agricultural and Horticultural Association.....	300
Somerset County—	
Somerset County Agricultural Society.....	301
Sussex County—	
Sussex County Agricultural Society.....	302
Union County—	
Union and Middlesex Counties Mutual Agricultural Association.....	303
Union County Farmers' Club.....	303
Warren County—	
Warren County Farmers', Mechanics' and Manufacturers' Association	305





UNIVERSITY OF ILLINOIS-URBANA



3 0112 112110777